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# AUTOMOTIVE INDUSTRIES

# Today's Cars are Longer Lived

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LIFE expectancy for passenger cars has increased from 7.04 years in 1924 to 8.58 years in 1938. During the same period of time the average age of cars in use has climbed from 3.07 years to 4.54 years. These changes may be attributed to several factors such as improved construction of passenger cars both in materials and design, better lubricating oils and greases, tires that add greatly to the riding qualities of the cars and thus relieve strains and stresses formerly experienced, and the great progress that has been made in our highway construction. However, in our opinion, the greatest single factor responsible for the increase in the life expectancy has been the general economic conditions throughout the country during the past eight years. The number of yearly trade-ins has materially decreased and the passenger car owner has been forced to realize that there are many more years of life in a car than prior to the depression period.

\* The Penn Mutual Life Insurance Company.

In 1926, Prof. C. E. Griffin of the University of Michigan conducted a thorough and comprehensive survey of motor vehicle registrations in order to determine the life expectancy of motor vehicles of various

ages, or, in other words, the rate at which automobiles are eliminated from use. The major result of his survey was a Generalized Life Table for Motor Vehicles, shown in the Chart below. While many attempts have been made to use this Life Table or modifications of it up through recent years, during the past four or five years the resultant estimates produced by its use were far from satisfactory and failed to apply to existing conditions. For this reason it was felt advisable to conduct a new survey of registrations in order to find out just what changes had occurred over the past 10 or 12 years.

In all of our work on this survey of registrations we have attempted to follow as closely as possible the method of procedure used by Professor Griffin. However, some deviations have been necessary due to changes in basic data. While he confined his study to the registrations of the State of Michigan alone, we felt it advisable to secure a larger sample which would be more representative of different areas of the country. We, therefore, took as our

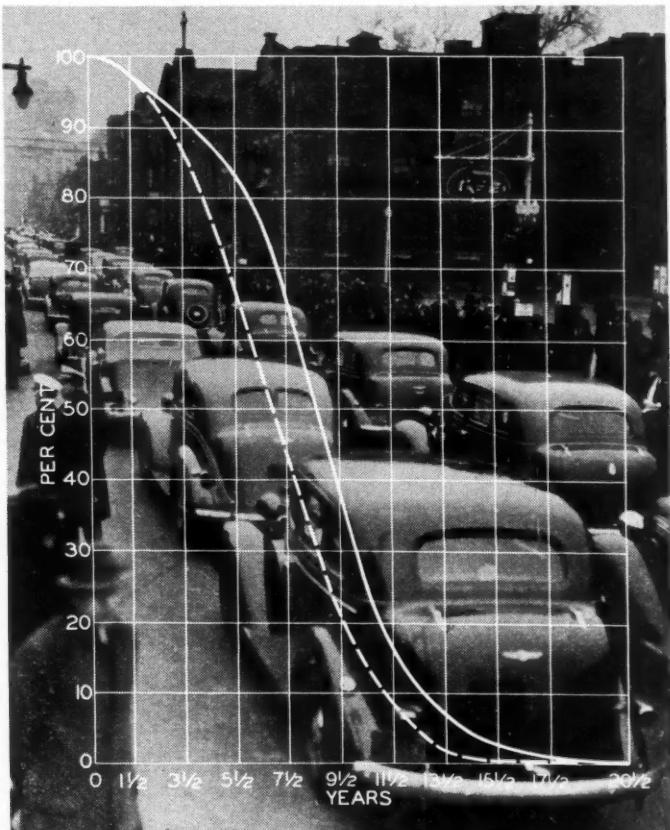


Chart showing the generalized life curve of automobiles as plotted on the dotted line by Professor C. E. Griffin for 1924 and the solid line plotted from 1938 data compiled by the authors

sample the passenger car registrations for the States of New York, Ohio and Kansas, which represented a total registration of over 4,000,000 passenger cars as compared with about 868,000 motor vehicles for the Michigan study. These car registrations were furnished us through the courtesy of the Motor Statistical Department of R. L. Polk & Co., who compile monthly new car and truck registrations and a yearly count of total registrations by makes of car or truck and their year of manufacture. Without this cooperation of R. L. Polk & Co., this survey could not have been made.

From these data of the 1937 and 1936 registrations it was found that the cars in the registrations of these two years were composed of cars of different years of manufacture. This breakdown is shown as follows:

Table 1

Year of Manufacture (1)	Number in 1937 Registrations (2)	Number in 1936 Registrations (3)	Number Eliminated (3 minus 2) (4)	Specific Death Rate in Per Cent (4 ÷ 2) (5)
1935.....	391,954	407,114	15,160	3.7
1934.....	319,178	328,372	9,194	2.8
1933.....	274,296	284,944	10,648	3.7
1932.....	220,950	228,052	7,102	3.1
1931.....	344,601	361,011	16,410	4.5
1930.....	389,942	422,318	32,376	7.7
1929.....	512,081	597,239	85,158	14.3
1928.....	275,346	362,822	87,476	24.1

Assuming 1936 cars to be  $\frac{1}{2}$  year old at the time of the 1937 registrations, it is a simple matter of arithmetic to construct a Life Curve or rate of elimination curve from the specific death rate shown in Table 1, above. Due to lack of data for cars over  $8\frac{1}{2}$  years of age, it was necessary to refer to Professor Griffin's death rate and to obtain empirical figures, following in general

the trend of his results, but modified to take into account the improved rates as shown by the preceding years. This Life Curve follows a clearly defined course. It has certain irregularities, however, which are to be expected in any statistical array. We have, therefore, smoothed out the curve, which is justifiable, not only to eliminate minor errors which might have occurred, but also because we desired, for practical purposes, a generalized curve applicable to the entire country rather than to just the three states involved.

Professor Griffin smoothed his curve by Makeham's Law which is the same mathematical law that has been found useful to describe the life curve of human beings. However, difficulty has been experienced in attempting to apply this law to present day mortality, and the same trouble was experienced in our present study. Accordingly we smoothed the curve graphically and present the resultant Generalized Life Table for Passenger Cars as shown below and also in the chart on page 201.

Table 2—Generalized Life Table for Passenger Cars

Age in Years	Number Living at First of Year	Age in Years	Number Living at First of Year
0	100,000	10½	25,000
½	98,000	11½	16,300
1½	97,100	12½	10,600
2½	94,800	13½	6,800
3½	91,800	14½	4,400
4½	88,000	15½	2,800
5½	83,400	16½	1,800
6½	77,000	17½	1,200
7½	66,000	18½	800
8½	52,200	19½	500
9½	37,800	20½	300

Having established the Generalized Life Curve for passenger cars it was then desirable to apply it to practical uses as pertaining to present day registrations. Total passenger

Table 3—Estimated Cars in Use by Year of Manufacture

Year of Manufacture	New Registrations for Model Years	Per Cent Surviving at End of Model Year	Number Surviving at End of Model Year
1938.....	1,839,285	100.0	1,839,285
1937.....	3,658,525	99.0	3,621,940
1936.....	3,312,090	97.1	3,216,039
1935.....	2,286,452	94.8	2,167,556
1934.....	1,888,557	91.8	1,733,695
1933.....	1,493,794	88.0	1,314,539
1932.....	1,096,399	83.4	914,397
1931.....	1,908,141	77.0	1,469,269
1930.....	2,625,979	66.0	1,733,146
1929.....	3,880,206	52.2	2,025,467
1928.....	3,139,579	37.8	1,186,761
1927.....	2,623,538	25.0	655,884
1926.....	3,228,401	16.3	526,229
1925.....	3,870,744	10.6	410,299
1924.....	3,303,646	6.8	224,648
1923.....	3,753,945	4.4	165,173
1922.....	2,417,104	2.8	67,679
1921.....	1,555,468	1.8	27,998
*1920.....	2,050,238	1.2	24,603
1919.....	1,850,865	0.8	14,807
1918.....	1,123,442	0.5	5,617
*1917.....	1,793,714	0.3	5,381

Total Surviving as of October 31, 1938..... 23,350,152

\*—U. S. Production less U. S. Exports.

†—From Nov. 1 to Oct. 31, the model year.

‡—Ten Months or 1935 Model Year.

car registrations are composed of cars that go into service each year throughout the United States. These registrations are naturally made up of new and used cars but for an analysis of these registrations it is necessary to use a count of the new cars that have gone into service each year for a period of 20 years. The only official count of such cars is that furnished by R. L. Polk & Co., which goes back to 1926. Prior to that time we had to rely on United States production of passenger cars less United States exports. We have based our calculations on the Model Years rather than the Calendar Years.

By the use of this Generalized Life Curve it is a simple matter to calculate the number of cars remaining in use of each model year of manufacture as shown above in Table 3.

(Turn to page 275, please)

## Estimated Cars in Use by Make and Year of Manufacture

(As of Oct. 31, 1938)

	1938†	1937†	1936†	1935‡	1934	1933	1932	1931	1930	1929	1928 and Older Cars
Auburn-Cord.....		1,538	2,157	4,579	5,082	4,433	9,713	22,743	7,438	9,318	9,018
Buick.....	162,357	207,082	143,616	59,470	57,896	38,552	41,456	69,972	80,953	89,944	220,942
Cadillac.....	9,240	12,204	11,262	4,273	4,497	3,435	5,228	8,575	7,971	7,796	21,517
Chevrolet.....	465,771	798,208	881,443	507,686	491,044	417,554	269,265	449,240	408,463	407,166	634,062
Chrysler-Maxwell.....	47,750	90,664	49,576	33,991	25,752	25,236	21,698	40,540	40,199	44,118	135,691
De Soto.....	36,357	73,662	38,531	21,987	10,508	18,708	21,109	21,891	23,276	31,118	5,491
Dodge.....	102,423	269,166	232,220	138,307	82,747	75,734	23,444	40,879	42,309	60,433	174,034
Durant.....	344,472	801,528	746,374	678,149	487,025	273,779	215,945	407,007	696,364	683,890	899,894
Ford.....							330	1,170	1,525	2,988	5,587
Franklin.....	4,785	15,010	15,277	13,398	11,830	8,913	10,723	14,791	19,892	31,574	33,529
Graham-G. Paige.....	40,751	12,768	21,000	16,513	17,724	2,592	7,206	14,775	20,107	32,725	63,198
Hudson.....	1,025	316	2,308	6,263	6,027	5,919	9,002	13,419	16,043	23,144	44,979
Hupmobile.....	14,567	29,642	11,372	9,085	4,757	3,264	3,209	5,300	7,433	10,591	9,832
La Salle.....	17,069	25,310	12,405	1,325	1,892	1,858	2,651	2,669	2,875	3,211	7,055
Lincoln and L. Zephyr.....	33,556	70,911	35,791	28,335	21,679	9,991	16,874	30,312	37,717	54,886	107,705
Nash-La Fayette.....	87,144	190,352	176,467	115,473	65,798	31,060	20,123	36,177	33,337	48,798	58,802
Oldsmobile.....	50,905	98,147	61,108	27,492	6,015	7,991	9,222	12,517	18,690	23,299	34,691
Packard.....	25	255	815	685	1,597	1,894	2,245	3,482	4,485	4,377	5,544
Pierce-Arrow.....	268,628	496,972	459,311	303,486	277,747	219,707	93,346	72,602	42,439	44,254	11,083
Plymouth.....	95,546	219,399	157,292	111,581	66,688	75,106	39,970	66,322	59,424	99,234	148,904
Pontiac-Oakland.....											
Reo.....			3,363	3,197	3,538	3,188	3,227	5,207	7,557	9,040	19,177
Studebaker.....	39,737	73,903	59,714	31,859	38,152	19,085	20,852	35,830	37,307	43,242	113,096
Terraplane-Essex.....			83,973	72,720	41,559	37,188	31,531	24,000	32,760	41,803	99,875
Willys-Overland.....	15,543	48,154	12,576	7,800	6,037	13,787	21,600	39,532	43,405	104,248	195,103
Total, These Makes.....	1,837,651	3,619,164	3,206,698	2,166,493	1,731,550	1,294,488	894,579	1,455,096	1,718,575	1,996,875	3,178,524

† Model years from Nov. 1 to Oct. 31.

‡ Ten months or 1935 model year.

# U. S. and WORLD PRODUCTION

## World Motor Vehicle Production by Countries—By Years

	1930	1931	1932	1933	1934	1935	1936	1937	1938†
United States .....	3,555,986	2,389,738	1,370,678	1,920,057	2,753,111	3,946,934	4,454,115	4,808,974	2,489,635
Canada .....	154,192	86,261	60,816	65,852	116,852	172,877	162,159	207,463	166,142
Total .....	3,510,178	2,472,359	1,431,494	1,985,909	2,869,963	4,119,811	4,616,274	5,016,437	2,655,777
Austria .....	3,200	4,100	2,364	1,575	1,355	2,509	5,275	6,043	*
Belgium .....	4,700	3,200	2,225	1,400	740	753	534	2,383	**
Czechoslovakia .....	16,840	16,980	13,580	10,000	10,000	9,978	12,141	13,813	13,000
Denmark .....	230	193	148	140	182	148	250	250	250
France .....	230,700	196,860	170,955	191,929	201,644	179,270	201,737	201,934	220,343
Germany .....	70,044	77,225	50,417	105,832	173,014	242,934	297,512	331,894	328,000
Hungary .....	841	237	121	143	222	111	465	615	500
Italy .....	42,685	29,280	29,100	42,000	43,416	45,208	43,600	66,000	70,388
Japan .....	371	531	675	1,808	2,845	6,800	9,632	14,430	30,000
Poland .....	288	200	175	780	800	788	2,400	2,200	7,600
Soviet Russia .....	7,972	20,500	26,849	49,675	72,466	97,000	138,400	199,123	215,000
Spain .....	450	250	435	375	830	591	.....	.....	.....
Sweden .....	2,400	2,444	2,995	2,975	3,122	3,404	4,451	6,626	8,335
Switzerland .....	1,000	1,070	996	480	436	460	296	700	**
United Kingdom .....	234,571	233,219	244,434	280,526	347,856	416,915	466,335	490,366	447,561
Total (Foreign) .....	616,292	576,289	545,469	689,638	858,928	1,006,869	1,183,028	1,336,377	1,340,977
World Total .....	4,126,470	3,048,648	1,976,963	2,675,547	3,728,891	5,126,680	5,799,302	6,352,814	3,996,754

\* Included with Germany. \*\* Included with miscellaneous totaling about 2,700.

† The American Automobile (Overseas Edition), all other years Automotive Division, Bureau of Foreign and Domestic Commerce.

## Wholesale Values of Production

(U. S. and Canada)

Year	Passenger Cars		Trucks		Cars and Trucks	
	Units*	Value	Units†	Value	Units	Value
1912	356,000	\$335,000,000	22,000	\$43,000,000	378,000	\$378,000,000
1913	461,500	399,902,000	23,500	44,000,000	485,000	443,902,000
1914	543,679	413,859,000	25,375	45,098,464	569,054	458,957,843
1915	895,930	575,978,000	74,000	125,800,000	960,930	701,778,000
1916	1,525,578	921,378,000	92,130	161,000,000	1,617,708	1,082,378,000
1917	1,745,792	1,053,505,781	128,157	220,982,668	1,873,949	1,274,488,499
1918	943,436	801,937,925	227,250	434,168,992	1,170,686	1,236,108,917
1919	1,657,652	1,461,785,925	275,943	423,326,621	1,933,595	1,885,112,546
1920	1,905,550	1,809,170,963	321,789	423,249,410	2,227,349	2,232,420,373
1921	1,518,061	1,031,752,452	184,304	169,914,098	1,682,365	1,261,666,550
1922	2,369,089	1,561,740,645	277,140	231,282,063	2,646,229	1,793,022,708
1923	3,753,945	2,274,554,488	426,505	317,478,940	4,180,450	2,592,033,428
1924	3,303,646	2,040,706,519	434,140	326,706,496	3,737,786	2,367,413,015
1925	3,870,744	2,544,528,799	557,056	470,634,763	4,427,800	3,015,163,562
1926	3,948,843	2,746,064,722	556,818	468,752,769	4,505,661	3,214,617,491
1927	3,083,360	2,285,633,102	497,020	435,072,641	3,580,380	2,700,705,743
1928	4,012,158	2,703,753,500	588,983	459,045,380	4,601,141	3,162,798,680
1929	4,794,898	2,981,141,842	826,811	595,504,039	5,621,709	3,576,645,881
1930	2,910,187	1,720,652,104	599,991	405,949,915	3,510,178	2,126,602,019
1931	2,038,183	1,153,907,947	434,176	272,748,305	2,472,359	1,426,656,252
1932	1,186,209	650,781,297	245,285	142,264,003	1,431,494	793,045,300
1933	1,627,367	795,304,780	358,614	192,131,509	1,985,981	987,436,289
1934	2,270,566	1,204,376,351	599,397	332,913,985	2,869,983	1,537,290,336
1935	3,387,806	1,788,635,180	732,005	399,211,522	4,119,811	2,187,846,702
1936	3,797,897	2,092,460,475	818,377	481,961,420	4,616,274	2,574,421,895
1937	4,068,935	2,397,717,534	947,502	573,310,107	5,016,437	2,971,027,641
1938	2,126,066	1,290,607,105	529,711	335,815,586	2,655,777	1,626,422,691

\* Includes Taxicabs.

† Includes Buses.

## For Automotive Export Data turn to page 248

### Foreign Production by Years

These figures do not include American cars assembled in European plants.

1924 .....	334,500
1925 .....	460,678
1926 .....	529,343
1927 .....	578,201
1928 .....	589,900
1929 .....	650,000
1930 .....	616,292
1931 .....	576,289
1932 .....	545,469
1933 .....	682,638
1934 .....	858,928
1935 .....	1,006,869
1936 .....	1,183,028
1937 .....	1,336,377
1938* .....	1,340,997

\* The American Automobile (Overseas Edition).

† Partly Estimated.

## Truck Production by Capacities

(U. S. and Canada)

Truck Tonnage	1932		1933		1934		1935		1936		1937		1938*	
	Number	%												
1/4 ton or less.....	79,127	32.3	98,926	27.6	172,089	28.6	249,957	34.1	316,208	38.6	395,157	41.7	208,071	39.2
1 ton and less than 1 1/2.....	1,618	.6	893	.2	2,341	.4	2,259	.3	9,686	1.1	21,580	2.3	15,795	3.0
1 1/2 ton and less than 2.....	144,113	58.8	228,238	63.7	376,475	62.9	420,597	57.5	423,503	52.0	441,156	46.6	252,393	47.7
2 1/2 ton and less than 3 1/2.....	7,620	3.1	15,666	4.4	25,995	4.3	28,950	4.0	30,637	3.7	30,431	3.2	16,792	3.2
3 1/2 ton and less than 5.....	6,006	2.4	7,728	2.2	11,136	1.9	10,465	1.4	12,309	1.5	18,971	2.0	9,486	1.8
5 ton.....	2,689	1.1	2,859	.8	4,752	.8	3,612	.5	4,621	.5	6,170	.6	4,757	.9
Over 5 ton and special types.....	1,407	.6	580	.2	1,219	.2	16,165	2.2	21,413	2.6	34,037	3.6	22,417	4.2
Total.....	245,285	100.0	358,548	100.0	599,397	100.0	732,005	100.0	818,377	100.0	947,502	100.0	529,711	100.0

\* Partly estimated.

February 25, 1939

# Passenger Car Production by Wholesale Price Classes

(U. S. and Canada)

	Number of Units								
	1930	1931	1932	1933	1934	1935	1936	1937	1938*
Under \$500	1,754,747	1,328,294	794,164	1,316,341	1,443,357	1,787,171	1,919,618	1,368,018	499,857
\$501-\$750	680,352	413,929	260,831	237,099	715,989	1,444,529	1,677,558	2,392,415	1,365,777
\$751-\$1,000	204,450	162,954	74,610	31,610	66,223	110,813	143,269	260,280	228,277
\$1,001-\$1,500	179,180	80,687	36,670	20,125	27,576	28,736	39,997	31,226	25,450
\$1,501-\$2,000	55,351	33,846	8,699	10,409	8,391	8,716	11,545	11,633	3,661
\$2,001-\$3,000	27,266	12,714	8,679	8,725	6,879	5,413	4,326	4,061	2,152
\$3,001 and over	8,841	5,759	2,532	2,052	2,151	2,428	1,584	1,302	892
Total	2,910,187	2,038,183	1,186,185	1,627,361	2,270,566	3,387,806	3,797,897	4,068,935	2,126,066

	Percentage of Total								
	1930	1931	1932	1933	1934	1935	1936	1937	1938
Under \$500	60.30	65.17	66.95	80.89	63.57	52.75	50.55	33.62	23.51
\$501-\$750	23.38	20.31	22.00	14.57	31.53	42.64	44.17	58.80	64.24
\$751-\$1,000	7.02	8.00	6.29	2.00	2.92	3.27	3.77	6.40	10.74
\$1,001-\$1,500	6.16	3.96	3.09	1.24	1.21	.85	1.05	.77	1.20
\$1,501-\$2,000	1.90	1.66	.73	.64	.37	.26	.30	.28	.17
\$2,001-\$3,000	.94	.62	.73	.54	.31	.16	.11	.10	.10
\$3,001 and over	.30	.28	.21	.12	.09	.07	.05	.03	.04
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

\* Partly estimated.

# Monthly Motor Vehicle Production

(U. S. and Canada)

## Passenger Cars

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	
January	212,244	364,773	242,672	142,869	101,915	112,754	117,700	235,806	308,589	324,191	168,890	January
February	301,320	431,755	293,036	187,948	98,604	93,153	193,875	287,142	234,872	310,961	151,133	February
March	386,510	546,489	348,087	241,727	106,003	103,396	291,546	377,374	357,068	423,006	186,341	March
April	384,778	571,956	393,804	300,960	126,597	156,712	303,806	407,721	436,576	482,907	190,111	April
May	404,444	541,310	382,619	282,096	165,025	188,675	290,268	322,485	401,139	443,412	168,589	May
June	381,026	469,260	298,130	215,979	166,646	213,602	272,090	306,300	388,183	429,333	147,545	June
July	357,682	439,598	230,761	187,324	101,478	198,587	231,501	283,715	379,823	372,913	112,114	July
August	422,996	452,857	190,864	158,851	79,073	196,333	190,825	186,133	212,140	317,270	61,687	August
September	374,276	375,046	182,049	111,336	66,489	161,734	129,251	59,499	92,324	120,597	69,449	September
October	351,899	328,305	117,014	59,176	37,468	107,593	86,128	220,113	194,690	308,040	192,906	October
November	223,896	176,629	104,668	49,996	49,201	43,866	50,072	347,830	351,171	309,121	335,767	November
December	211,087	96,920	126,483	99,921	87,710	52,954	113,504	353,688	441,322	259,184	341,524	December
Total	4,012,158	4,794,896	2,910,187	2,038,183	1,186,209	1,627,361	2,270,566	3,387,806	3,797,897	4,068,935	2,126,066	Total

## Motor Trucks

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	
January	27,947	57,765	40,938	35,475	21,160	19,429	44,870	64,529	68,655	74,995	58,262	January
February	34,980	65,950	52,925	41,863	24,291	15,592	44,952	63,204	65,938	72,939	51,464	February
March	44,273	79,587	69,031	47,671	21,274	18,508	61,068	70,520	81,875	96,016	52,256	March
April	49,537	91,855	74,477	53,138	28,539	27,975	67,532	69,338	91,049	100,324	48,018	April
May	56,281	94,940	62,080	47,805	27,491	35,132	60,348	59,324	78,379	96,965	41,575	May
June	44,169	98,164	51,466	41,496	23,572	43,448	48,292	65,785	81,185	91,820	41,857	June
July	59,630	78,703	44,960	35,386	15,137	39,310	44,548	61,582	71,383	83,996	38,336	July
August	69,547	59,985	43,296	32,890	15,319	42,601	53,890	58,942	63,794	87,802	35,259	August
September	62,231	54,683	46,557	31,876	20,003	35,874	46,335	33,229	47,496	55,033	20,174	September
October	63,921	66,235	41,922	22,408	14,157	30,772	49,643	60,203	35,359	31,939	22,380	October
November	48,013	50,368	37,493	20,118	12,560	19,106	35,107	60,720	54,828	67,508	54,638	November
December	32,454	28,582	34,840	24,052	21,782	30,801	42,814	64,629	77,636	88,165	65,492	December
Total	588,983	826,817	599,991	434,176	245,285	358,548	599,397	732,005	818,377	947,502	529,711	Total

## Passenger Cars and Trucks

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	
January	240,191	422,538	283,610	178,344	123,075	132,183	162,570	300,335	377,244	399,186	227,152	January
February	336,300	497,705	345,961	229,811	122,895	108,745	238,827	350,348	300,810	383,900	202,597	February
March	430,783	626,076	417,118	289,398	127,277	121,904	352,614	447,894	438,943	519,022	238,597	March
April	434,315	663,811	468,281	384,098	155,138	184,687	371,338	477,059	527,625	553,231	238,129	April
May	459,725	636,250	444,699	329,901	192,516	223,807	350,616	381,809	480,518	540,377	210,174	May
June	425,195	567,424	349,596	257,475	190,218	257,050	320,382	372,085	469,368	521,153	189,402	June
July	417,312	518,301	275,721	222,710	116,615	235,897	276,047	345,297	451,206	456,909	150,450	July
August	492,543	512,842	234,160	191,741	94,392	238,934	244,715	245,075	275,934	405,072	96,948	August
September	436,507	429,729	228,606	143,212	86,492	197,608	175,588	92,728	139,820	175,630	89,623	September
October	415,820	394,540	158,942	81,582	51,625	138,365	135,771	280,318	230,049	337,979	215,286	October
November	268,909	226,997	142,161	70,114	61,761	62,974	85,179	408,550	405,799	376,629	390,405	November
December	243,541	125,502	161,323	123,973	109,492	83,755	156,318	418,317	518,958	347,349	407,016	December
Total	4,601,141	5,621,715	3,510,178	2,472,359	1,431,494	1,985,909	2,869,963	4,119,811	4,616,274	5,016,437	2,655,777	Total

Figures from U. S. Census Bureau (includes overseas assemblies of motor vehicles of American make) and Dominion Bureau of Statistics.

## Passenger Car Production by Cylinders

(U. S. and Canada)

	Per Cent Fours	Per Cent Sixes	Per Cent Eights	Per Cent Twelves and Sixteens	Total
1926	64.0	34.0	2.0	..	100.0
1927	49.7	47.1	3.2	..	100.0
1928	50.7	45.0	4.3	..	100.0
1929	40.7	54.3	5.0	..	100.0
1930	44.5	43.6	11.8	0.1	100.0
1931	33.3	52.0	14.5	0.2	100.0
1932	17.9	50.4	31.1	0.6	100.0
1933	3.2	61.8	34.7	0.3	100.0
1934	1.2	59.8	38.8	0.2	100.0
1935	0.5	59.5	39.4	0.2	100.0
1936	0.5	66.5	32.4	0.6	100.0
1937	1.7	63.8	33.7	0.8	100.0
1938	0.7	64.1	34.3	0.9	100.0

## Average Wholesale Price of Passenger Cars and Trucks

(Based on Units and Value of Production)

	Passenger Cars	Trucks
1921	\$720	\$1,035
1922	660	834
1923	607	745
1924	618	753
1925	656	843
1926	695	842
1927	735	875
1928	673	781
1929	622	720
1930	591	678
1931	566	629
1932	548	580
1933	489	536
1934	530	555
1935	528	545
1936	551	589
1937	589	605
1938	607	634

## State Gasoline Taxes and Registration Fees

STATE	State Tax per Gallon (Cents)	State Gasoline Tax Receipts		State Registration Fees		Per Cent Change	Per Cent Change	Total State Tax Receipts from Gasoline and Registration Fees		State Taxes per Motor Vehicle	
		1938	1937	1938	1937			1938	1937	1938	1937
Alabama	6	\$13,448,000	\$13,295,000	+1.1	\$3,102,000	\$4,439,000	-30.0	\$16,550,000	\$17,734,000	\$56.96	\$59.08
Arizona	5	4,225,000	4,325,000	-2.3	1,150,000	1,143,000	+0.6	5,375,000	5,468,000	41.73	42.31
Arkansas	6½	10,013,000	9,877,000	+1.2	2,914,000	3,241,000	-10.0	12,927,000	13,118,000	58.38	58.68
California	3	46,811,000	46,614,000	+0.2	12,972,000	24,003,000	-46.0	59,763,000	70,617,000	24.04	28.43
Colorado	4	7,488,000	7,431,000	+0.7	2,352,000	2,603,000	-9.6	9,821,000	10,034,000	29.24	29.66
Connecticut	3	9,361,000	9,445,000	-0.7	6,441,000	6,691,000	-3.5	15,822,000	16,136,000	36.51	36.98
Delaware	4	2,200,000	2,031,000	+8.3	1,300,000	1,202,000	+8.2	3,500,000	3,233,000	54.43	50.83
District of Columbia	2	2,600,000	2,724,000	-4.5	1,782,000	878,000	+103.0	4,382,000	3,602,000	28.57	19.56
Florida	7	22,800,000	22,063,000	+3.5	6,109,000	6,196,000	-1.4	28,909,000	28,219,000	68.42	67.00
Georgia	6	19,630,000	19,550,000	+0.4	1,654,000	2,368,000	-30.1	21,264,000	21,918,000	48.77	49.53
Idaho	5	4,089,000	4,035,000	+1.2	2,766,000	2,498,000	+10.8	6,855,000	6,533,000	49.88	46.06
Illinois	3	36,483,000	35,836,000	+1.9	21,153,000	21,430,000	-1.4	57,636,000	57,266,000	32.19	32.22
Indiana	4	22,288,000	22,987,000	-3.0	9,719,000	9,827,000	-1.1	32,007,000	32,814,000	34.89	34.32
Iowa	3	13,344,000	13,023,000	+2.8	11,779,000	11,918,000	-1.4	25,123,000	24,941,000	33.81	33.58
Kansas	3	10,000,000	10,083,000	-0.8	4,400,000	4,537,000	-2.8	14,400,000	14,620,000	25.08	24.91
Kentucky	5	12,532,000	12,671,000	-1.0	5,000,000	5,125,000	-2.5	17,532,000	17,796,000	42.62	44.06
Louisiana	7	16,548,000	15,923,000	+4.0	4,500,000	4,710,000	-4.5	21,048,000	20,633,000	65.31	62.64
Maine	4	5,562,000	5,550,000	+0.2	3,800,000	3,865,000	-1.5	9,362,000	9,415,000	48.01	46.88
Maryland	4	9,929,000	9,857,000	+0.7	4,571,000	5,577,000	-18.0	14,500,000	15,434,000	36.71	40.24
Massachusetts	3	20,543,000	19,836,000	+3.7	6,804,000	6,875,000	-15.5	27,347,000	26,711,000	32.45	31.52
Michigan	3	27,679,000	29,425,000	-6.0	20,848,000	22,085,000	-5.4	48,527,000	51,510,000	34.44	34.13
Minnesota	4	17,839,000	15,293,000	+16.7	9,277,000	8,867,000	+4.8	27,116,000	24,160,000	33.01	29.38
Mississippi	6	11,000,000	10,222,000	+7.8	2,200,000	2,248,000	-2.1	13,200,000	12,470,000	61.11	55.52
Missouri	2	11,089,000	11,082,000	...	9,408,000	9,638,000	-2.4	20,497,000	20,720,000	24.40	24.78
Montana	5	4,428,000	4,581,000	-3.4	1,500,000	1,532,000	-2.0	5,928,000	6,113,000	34.60	35.15
Nebraska	5	12,000,000	10,925,000	+9.8	2,500,000	2,603,000	-3.8	14,500,000	13,528,000	35.45	32.59
Nevada	4	1,198,000	1,177,000	+1.8	275,000	282,000	-2.5	1,473,000	1,459,000	37.62	35.88
New Hampshire	4	3,374,000	3,286,000	+2.5	2,731,000	2,347,000	+16.1	6,105,000	5,633,000	50.35	45.32
New Jersey	3	21,700,000	21,565,000	+0.8	20,298,000	19,271,000	+5.2	41,998,000	40,636,000	42.00	41.06
New Mexico	5	4,043,000	4,003,000	+1.0	1,917,000	1,544,000	+24.0	5,960,000	5,547,000	49.60	45.57
New York	4	66,132,000	61,841,000	+7.0	46,619,000	52,901,000	-11.7	112,751,000	114,742,000	43.55	44.35
North Carolina	6	23,310,000	22,429,000	+4.0	7,487,000	8,855,000	-15.5	30,797,000	31,284,000	58.74	60.09
North Dakota	3	2,285,000	2,873,000	-20.5	1,524,000	1,551,000	-3.5	3,809,000	4,454,000	21.85	25.71
Ohio	4	48,664,000	46,538,000	+4.7	24,523,000	25,635,000	-4.4	73,187,000	72,173,000	44.09	38.46
Oklahoma	4	13,911,000	13,768,000	+1.1	6,514,000	5,584,000	+16.9	20,425,000	19,352,000	38.24	35.36
Oregon	5	9,838,000	9,799,000	+0.3	2,899,000	3,378,000	-14.1	12,737,000	13,177,000	35.84	36.56
Pennsylvania	4	51,918,000	55,711,000	-7.0	34,407,000	38,332,000	-10.3	86,325,000	94,043,000	43.05	46.67
Rhode Island	3	3,515,000	3,090,000	+13.9	2,778,000	2,790,000	-0.5	6,293,000	5,880,000	36.96	34.82
South Carolina	6	11,000,000	10,901,000	+1.0	1,266,000	1,690,000	-24.0	12,286,000	12,591,000	44.00	45.02
South Dakota	4	4,048,000	4,071,000	-0.6	1,570,000	1,650,000	-4.8	5,618,000	5,721,000	31.02	30.97
Tennessee	7	18,268,000	17,914,000	+2.0	3,776,000	4,233,000	-10.7	22,044,000	22,147,000	57.16	55.31
Texas	4	42,561,000	41,671,000	+2.0	19,731,000	19,684,000	+0.2	62,292,000	61,355,000	41.42	42.03
Utah	4	3,524,000	3,421,000	+3.0	1,013,000	1,049,000	-3.1	4,537,000	4,470,000	27.64	35.30
Vermont	4	2,529,000	2,323,000	+8.9	2,377,000	2,410,000	-1.4	4,906,000	4,733,000	56.13	54.14
Virginia	5	16,616,000	16,114,000	+3.1	6,027,000	6,153,000	-2.0	22,643,000	22,267,000	52.22	51.52
Washington	5	15,394,000	15,268,000	+1.0	2,874,000	4,402,000	-34.8	18,268,000	19,670,000	34.90	36.73
West Virginia	5	9,557,000	8,488,000	+12.7	4,699,000	6,162,000	-23.7	14,256,000	14,650,000	54.79	50.40
Wisconsin	4	19,253,000	19,537,000	-1.5	13,080,000	12,984,000	+0.9	32,333,000	32,521,000	38.63	37.78
Wyoming	4	2,461,000	2,498,000	-1.5	601,000	597,000	+0.8	3,062,000	3,095,000	37.78	37.83
Total		\$769,029,000	\$756,930,000	+1.5†	\$369,007,000	\$399,613,000	-7.5†	\$1,138,036,000	\$1,156,543,000	\$38.98†	\$38.34†

† Average.

# NEW VEHICLE

## New Passenger Car Registrations†

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Auburn	17,850	11,270	29,536	11,646	5,038	5,536	5,163	1,848	146	700
Austin		4,354	2,941		3,675	1,057				
Buick	*172,307	*122,656	90,873	49,708	43,809	63,067	87,635	160,687	205,297	166,380
Cadillac	14,936	12,078	11,136	6,259	3,903	4,893	6,692	11,766	11,231	10,639
Chevrolet	780,011	618,884	583,429	322,880	474,493	534,906	656,698	930,250	768,040	484,337
Chrysler	84,518	60,908	52,650	26,016	28,577	28,052	40,536	58,698	91,622	46,184
Continental					3,310	953				
Cord	799	1,879	1,418	335				1,174	1,149	
De Soto	59,614	35,267	28,430	25,311	21,260	11,447	26,952	45,088	74,424	35,259
De Vaux			4,808	1,358						
Dodge	115,773	64,105	53,090	28,111	88,062	90,139	178,770	248,518	255,258	104,881
Durant	47,715	21,440	7,229	1,135						
Ford	1,310,135	1,055,097	528,581	258,927	311,113	530,528	826,519	748,554	765,933	363,688
Franklin	10,704	7,482	3,881	1,829	1,329	260				
Graham	69,487	30,140	19,209	12,858	10,128	12,987	15,965	16,439	13,984	4,139
Hudson	62,692	30,466	19,189	8,641	2,946	19,307	21,587	20,825	90,043	40,889
Hupmobile	44,337	24,307	17,427	10,794	6,726	6,556	7,450	1,556	403	1,020
La Fayette						9,301	17,445			
La Salle	20,290	11,262	6,883	3,848	3,709	5,182	11,775	13,992	28,909	15,732
Lincoln	6,151	4,356	3,466	3,179	2,112	2,061	2,370	15,567	25,243	16,991
Marmon	*22,323	*12,369	5,687	1,365	86					6,835
Mercury										
Nash	105,146	51,086	39,366	20,233	11,353	14,315	17,739	*43,070	70,571	31,814
Oakland	31,830	21,648	12,985							
Oldsmobile	*93,483	*50,510	*46,983	24,128	35,295	71,676	149,375	178,488	188,306	92,398
Packard	44,634	28,318	16,256	11,058	9,081	6,552	37,653	68,772	95,455	49,163
Pierce-Arrow	8,386	6,795	4,522	2,692	2,152	1,740	875	787	167	17
Plymouth	84,969	64,301	94,289	111,926	249,667	302,557	382,985	499,580	462,258	286,241
Pontiac	158,272	68,389	73,148	47,926	85,348	72,645	140,122	171,669	212,403	98,399
Reo	17,319	11,450	6,762	3,870	3,623	3,854	3,894	3,146		
Rockne			2	16,966	14,554					
Studebaker	82,839	56,526	46,533	25,002	21,688	41,560	39,573	67,935	70,048	41,504
Terraplane (Essex)	191,331	63,338	42,545	28,778	35,831	40,510	53,838	78,471	*	
Willys-Whippet	162,366	51,687	42,936	22,483	15,314	6,576	10,439	12,423	51,411	13,012
Willys-Knight	37,343	14,079	8,405	3,415	353					
Miscellaneous	31,646	9,532	3,548	3,732	1,159	324	1,858	5,294	1,441	799
Total	3,880,246	2,625,979	1,908,141	1,096,399	1,493,794	1,888,557	2,743,908	3,405,497	3,483,752	1,891,021

## By Manufacturing Groups

	Chrysler Corp.	Ford Motor Co.	General Motors	All Others
	344,674	224,581	228,459	191,384
	1,316,286	1,059,453	532,047	262,106
	1,271,129	905,427	825,437	454,739
	947,917	436,518	322,198	98,190
				148,347
				171,398
				233,479
				321,640
				394,818
				183,057

† Data from R. L. Polk & Co.

## In Percentage of Total by Makes

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Auburn	.46	.43	1.55	1.08	.34	.29	.19	.05		
Austin		.17	.15		.25	.06				.04
Buick	4.44	4.67	4.76	4.53	2.93	3.34	3.19	4.72	5.89	8.80
Cadillac	.38	.46	.58	.57	.26	.26	.24	.35	.32	.56
Chevrolet	20.10	23.57	30.59	29.46	31.77	28.32	23.93	27.33	22.05	24.56
Chrysler	2.18	2.32	2.76	2.37	1.92	1.49	1.48	1.72	2.63	2.44
Continental					.22	.05				
Cord	.02	.07	.07	.03				.03	.03	
De Soto	1.54	1.34	1.49	2.31	1.42	.61	.98	1.32	2.14	1.86
De Vaux			.25	.12						
Dodge	2.98	2.44	2.78	2.56	5.76	4.77	6.52	7.30	7.33	6.55
Durant	1.23	.82	.38	.10						
Ford	33.76	40.18	27.70	23.62	20.83	28.09	30.12	21.99	21.99	19.24
Franklin	.28	.28	.20	.17	.09	.02				
Graham	1.56	1.15	1.01	1.17	.68	.68	.58	.48	.40	.22
Hudson	1.62	1.16	1.01	.79	.20	1.02	.79	.61	2.58	2.16
Hupmobile	1.14	.93	.91	.98	.45	.35	.27	.05	.01	.05
La Fayette							.49	.64		
La Salle	.52	.43	.36	.35	.25	.27	.43	.41	.83	.83
Lincoln	.16	.17	.18	.29	.14	.11	.09	.46	.72	.90
Marmon	.58	.47	.30	.12	.01					
Mercury										.36
Nash	2.71	1.95	2.06	1.85	.76	.76	.65	1.27	2.03	1.68
Oakland	.82	.82	.68							
Oldsmobile	2.41	1.92	2.46	2.20	2.36	3.80	5.44	5.25	5.41	4.89
Packard	1.15	1.08	.85	1.01	.61	.35	1.37	2.02	2.74	2.60
Pierce-Arrow	.22	.28	.24	.25	.14	.09	.03	.02		
Plymouth	2.19	2.45	4.94	10.21	16.71	16.02	13.96	14.68	13.27	15.14
Pontiac	4.08	2.60	3.83	4.37	5.71	3.85	5.11	5.04	6.10	5.20
Reo	.45	.44	.35	.35	.24	.20	.14	.09		
Rockne					.97					
Studebaker	2.13	2.15	2.44	2.28	1.45	2.20	1.44	1.99	2.01	2.19
Terraplane (Essex)	4.93	2.41	2.23	2.62	2.40	2.15	1.96	2.30	*	*
Willys-Whippet	4.18	1.97	2.25	2.05	1.03	.35	.38	.36	1.47	.69
Willys-Knight	.96	.54	.44	.31	.02					
Miscellaneous	.82	.35	.20	.35	.08	.01	.07	.16	.05	.04
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

## By Manufacturing Groups

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Chrysler Corp.	8.89	8.55	11.97	17.45	25.82	22.89	22.93	25.02	25.36	24.99
Ford Motor Co.	33.92	40.34	27.88	23.91	20.97	28.20	30.21	22.44	22.71	20.49
General Motors	32.75	34.48	43.26	41.48	43.28	39.84	38.35	43.09	40.80	44.84
All Others	24.44	16.63	16.89	17.16	9.93	9.07	8.51	9.45	11.33	9.68

\*1929-1930

Buick includes Marquette.  
Marmon includes Roosevelt.  
Oldsmobile includes Viking.

Oldsmobile includes Viking.

Nash includes La Fayette for 10 months.

\*1937-1938

Terraplane included with Hudson.  
Austin now Bantam.

# REGISTRATIONS

## New Truck Registrations<sup>‡</sup>

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Autocar	2,941	2,009	1,748	1,015	1,127	1,139	1,001	1,451	2,181	1,617
Brockway	4,533*	3,780*	1,685*	752	875	1,213	1,245	1,695	1,593	1,303
Chevrolet	160,892	118,253	99,800	60,784	99,880	157,507	167,129	204,344	183,674	119,479
Diamond T	3,590	2,888	2,483	2,250	4,139	5,440	6,454	8,750	8,118	4,393
Dodge	28,567	15,558	13,518	8,744	28,034	48,252	61,488	85,295	64,098	33,656
Federal	2,853	2,095	1,523	1,167	1,360	1,982	2,190	2,930	2,339	1,370
Ford	223,405	197,216	138,854	66,937	62,397	128,250	185,848	177,244	189,376	100,959
G. M. C.	14,248	9,004	6,919	6,359	6,602	10,449	11,442	26,980	43,522	20,152
Hudson								638	1,905	4,823
Indiana					957	1,252	729	862	1,705	719
International	31,434	23,703	21,073	15,752	26,658	31,555	53,471	71,958	76,174	55,836
Mack	6,823	4,943	2,945	1,425	1,852	1,830	1,515	4,226	5,513	4,406
Plymouth							660	2,420	13,709	6,652
Reo	12,894	6,427	5,166	3,187	3,042	5,035	5,101	4,227	4,254	2,929
Sterling	1,577	1,244	739	227	108	134	174	277	311	267
Stewart	2,163	2,315	1,394	867	684	736	880	1,280	1,148	390
Studebaker	1,661	1,518	3,495	2,430	2,407†	1,697	2,100	3,279	5,129	2,000
White	6,121	4,395	2,561	2,138	1,384	3,963	3,304	5,757	5,933	3,514
Willys	6,536	4,264	3,131	1,132	233	25	2,280	2,441	1,122	1,889
All Others	16,819	11,107	7,050	4,290	4,035	3,970	2,901	3,480	3,861	3,383
Total	527,057	410,699	313,884	180,413	245,869	403,886	510,683	611,644	618,249	365,349

\* includes Indiana. † includes Rockne. ‡ Data from R. L. Polk & Co.

## U. S. Registrations of New Cars and Trucks\*

### U. S. New Passenger Car Registrations

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
January	136,071	219,760	180,094	126,776	87,493	79,821	61,242	136,635	215,775	280,685	145,765
February	165,537	235,590	211,645	134,133	82,813	69,464	94,887	170,615	176,651	215,049	120,359
March	254,214	377,802	298,824	200,841	92,192	78,741	173,287	261,477	301,239	383,738	181,222
April	332,056	481,675	357,064	265,732	121,093	119,909	223,050	319,650	397,186	384,951	192,241
May	351,459	454,132	345,031	247,727	131,282	160,242	219,225	293,199	392,744	381,697	178,052
June	317,069	386,398	260,861	201,911	148,752	174,190	223,864	280,360	368,422	360,236	156,384
July	324,120	432,503	254,098	194,322	104,188	185,660	229,006	285,178	357,490	385,767	148,896
August	329,674	376,886	203,737	155,744	93,457	178,661	193,198	233,851	262,912	306,958	127,954
September	271,821	304,452	175,286	124,903	81,893	157,976	146,931	157,098	208,896	235,683	93,269
October	284,939	288,697	150,219	102,659	63,195	136,326	140,937	149,389	171,397	202,898	119,053
November	211,736	183,756	93,066	75,829	44,358	94,180	107,574	220,262	223,732	196,463	200,853
December	160,883	138,555	96,054	77,564	45,583	58,624	75,356	237,194	327,053	178,621	226,973
Total	3,139,579	3,880,206	2,625,979	1,908,141	1,096,399	1,493,794	1,888,557	2,743,908	3,404,497	3,483,752	1,891,021

### U. S. New Truck Registrations

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
January	16,431	29,900	30,236	24,415	14,776	11,709	22,903	34,759	43,760	47,618	31,995
February	17,510	32,637	31,880	23,466	14,558	9,707	24,476	34,797	40,301	41,843	27,551
March	24,698	46,368	42,199	30,809	16,674	9,934	33,884	41,511	52,428	60,301	37,255
April	30,272	56,299	47,029	36,848	17,784	17,301	38,882	46,785	64,956	67,632	35,682
May	32,468	52,874	43,286	33,496	18,896	20,925	39,831	47,988	62,183	65,857	32,937
June	29,155	45,114	33,531	28,496	17,876	23,254	34,768	48,243	56,851	58,626	30,647
July	31,844	57,943	39,904	30,102	14,731	30,642	37,490	51,243	63,695	61,686	33,475
August	36,753	52,557	33,787	27,070	15,081	28,799	40,790	50,355	59,222	60,872	34,231
September	35,135	46,560	33,933	25,967	14,967	31,269	37,225	41,390	54,611	54,711	28,570
October	40,890	49,899	34,237	24,685	15,156	28,058	40,878	37,439	41,220	40,246	19,589
November	27,491	33,631	22,012	15,553	10,392	18,691	28,688	36,935	30,255	27,248	23,943
December	18,476	23,275	18,665	13,177	9,522	15,580	24,070	39,258	42,162	31,409	31,474
Total	341,123	527,057	410,699	313,884	180,413	245,869	403,886	510,683	611,644	618,249	365,349

### Total U. S. New Passenger Car and Truck Registrations

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
January	152,502	249,680	210,330	151,191	102,269	91,530	84,145	171,394	259,535	328,303	177,760
February	183,047	268,227	243,525	157,599	97,371	79,171	119,363	205,412	216,952	256,892	147,910
March	278,912	424,170	341,023	231,450	109,066	88,675	207,171	302,988	353,667	424,039	218,477
April	362,328	537,974	404,093	302,580	138,877	137,210	261,932	366,435	462,142	452,783	227,923
May	383,927	507,006	388,317	281,223	149,978	181,167	259,056	341,167	454,927	457,554	210,989
June	346,224	431,512	294,392	230,407	166,628	197,444	258,632	328,603	426,273	418,862	187,031
July	355,964	490,446	294,002	224,424	118,919	216,302	266,495	336,421	421,185	427,453	182,371
August	366,427	429,443	237,524	182,814	108,538	207,460	233,988	284,206	322,134	367,830	162,185
September	306,956	351,012	209,219	150,870	96,860	189,245	184,158	198,488	263,507	290,394	119,839
October	325,829	338,596	184,456	127,344	78,351	164,394	181,815	185,828	212,617	243,144	138,642
November	239,227	217,387	115,078	91,382	54,750	112,871	136,263	257,197	253,987	223,717	224,796
December	179,359	161,830	114,718	90,741	55,205	74,204	99,426	276,452	369,215	211,030	256,447
Total	3,480,702	4,407,263	3,036,678	2,222,025	1,276,812	1,739,683	2,292,443	3,254,591	4,016,141	4,102,001	2,256,370

\* Figures from R. L. Polk & Co.

## U. S. New Car Registrations and Estimated Dollar Volume

Month	1935			1936			1937			1938		
	Units †	Dollar * Volume	Average Price per Car	Units †	Dollar * Volume	Average Price per Car	Units †	Dollar ‡ Volume	Average Price per Car	Units †	Dollar ‡ Volume	Average Price per Car
January.....	136,527	\$96,400,000	\$706	215,771	\$149,100,000	\$691	280,350	\$222,300,000	\$768	145,663	\$126,600,000	\$869
February.....	170,526	119,300,000	700	176,646	120,900,000	684	214,834	167,800,000	781	120,261	104,400,000	868
March.....	261,421	182,600,000	698	301,256	207,900,000	690	363,477	286,200,000	787	181,037	157,200,000	868
April.....	319,590	225,400,000	705	397,103	275,700,000	694	385,187	305,300,000	793	192,086	166,800,000	868
May.....	293,149	199,900,000	682	391,542	271,100,000	692	391,608	309,900,000	791	177,951	154,300,000	866
June.....	280,309	190,900,000	681	368,469	253,500,000	688	360,159	285,100,000	792	156,290	135,600,000	867
July.....	285,161	192,500,000	675	356,815	244,600,000	686	365,783	288,200,000	788	148,798	128,400,000	863
August.....	233,820	157,700,000	674	262,709	181,800,000	692	307,285	244,600,000	796	127,955	110,100,000	860
September.....	157,071	107,000,000	681	208,517	143,800,000	689	231,851	187,600,000	809	93,165	79,700,000	856
October.....	147,801	106,700,000	722	170,959	122,000,000	713	202,471	168,000,000	830	118,957	105,700,000	888
November.....	219,710	152,100,000	692	222,787	162,700,000	730	198,133	176,200,000	888	200,802	172,300,000	857
December.....	237,161	164,600,000	694	326,697	236,900,000	725	179,687	157,900,000	879	226,832	193,200,000	851
Total.....	2,742,246	\$1,895,100,000	\$691	3,399,271	\$2,370,000,000	\$697	3,478,825	\$2,799,100,000	\$805	1,889,797	\$1,634,300,000	\$864

† The difference between the number of units shown here and those for new car registrations by years is due to the cars grouped under "Miscellaneous" of which no account is taken in these calculations.

\* All calculations are based on list price F.O.B. factory of the five-passenger, four-door sedan in conjunction with new car registrations of each model.

‡ These data are not comparable with previous years as during 1937 and 1938 "Delivered Price at Factory" was used in place of the "List Price F.O.B. Factory" of former years.

## New Motor Vehicle Registrations by States\*

	Passenger Cars			Trucks			New Motor Vehicles			Total		
	1938	1937	1936	1938	1937	1936	1938	1937	1936	1938	1937	1936
Alabama.....	19,427	34,936	35,198	7,041	12,874	13,187	26,468	47,810	48,385	1.17	1.16	1.21
Arizona.....	6,738	12,562	12,758	2,051	3,859	3,510	8,789	16,221	16,268	.39	.40	.41
Arkansas.....	12,244	19,793	19,612	5,909	10,836	9,485	18,153	30,629	29,097	.80	.75	.72
California.....	148,011	246,075	256,255	23,846	36,901	33,656	171,857	282,296	289,911	7.62	6.90	7.22
Colorado.....	17,699	32,505	35,721	4,771	8,411	9,060	22,470	40,916	44,781	1.00	1.00	1.11
Connecticut.....	26,283	51,268	51,342	4,422	7,767	8,240	30,705	59,035	58,582	1.36	1.44	1.48
Delaware.....	5,429	9,748	8,477	1,161	1,882	1,723	6,590	11,630	10,200	.29	.28	.25
District of Columbia.....	17,944	28,259	32,787	1,753	2,857	2,940	19,697	31,116	35,727	.87	.76	.89
Florida.....	26,102	43,445	38,988	6,540	10,722	9,412	32,642	54,167	48,400	1.45	1.32	1.21
Georgia.....	25,319	48,823	43,581	6,818	12,998	12,941	32,137	61,821	56,522	1.42	1.51	1.41
Idaho.....	6,883	14,139	14,438	2,613	4,454	4,193	9,496	18,593	19,377	.42	.45	.48
Illinois.....	133,914	250,205	236,138	18,055	30,451	31,123	151,969	280,656	267,261	6.74	6.84	6.65
Indiana.....	56,339	123,971	116,280	9,899	18,269	20,027	66,238	142,240	136,307	2.95	3.47	3.39
Iowa.....	47,489	68,196	71,883	8,940	12,449	12,999	56,429	80,645	84,882	2.50	1.97	2.11
Kansas.....	27,301	56,315	54,094	7,960	12,409	11,406	35,261	68,724	65,500	1.56	1.67	1.63
Kentucky.....	22,906	41,391	40,109	7,244	11,597	10,870	30,150	52,988	50,979	1.34	1.29	1.27
Louisiana.....	24,842	34,084	37,471	6,155	10,111	9,753	30,997	44,195	47,224	1.37	1.08	1.18
Maine.....	11,038	20,048	17,890	3,315	5,658	5,337	14,353	25,706	23,227	.64	.63	.58
Maryland.....	27,331	46,371	44,228	4,741	7,763	7,382	32,072	54,134	51,610	1.42	1.32	1.29
Massachusetts.....	63,682	115,603	117,261	9,459	16,235	15,350	73,141	131,838	132,611	3.24	3.21	3.31
Michigan.....	87,184	241,156	226,968	11,268	24,549	24,840	98,452	265,705	251,808	4.36	4.68	4.27
Minnesota.....	52,667	82,874	81,773	8,674	13,555	14,144	61,341	96,429	95,917	2.72	2.35	2.39
Mississippi.....	13,670	22,646	25,006	5,826	11,176	10,367	19,496	33,822	35,373	.86	.82	.88
Missouri.....	55,543	89,965	87,687	11,718	19,170	20,142	67,261	109,135	107,829	2.98	2.66	2.68
Montana.....	10,154	18,062	20,745	4,112	5,044	5,930	14,266	23,106	26,675	.63	.56	.66
Nebraska.....	22,319	33,640	37,695	4,664	6,202	6,996	26,983	39,845	44,681	1.20	.97	1.11
Nevada.....	2,576	4,767	5,255	731	1,167	1,210	3,307	5,934	6,465	.15	.14	.16
New Hampshire.....	7,060	12,961	12,258	1,759	3,022	3,196	8,821	15,983	15,454	.39	.39	.38
New Jersey.....	70,764	122,103	111,737	11,591	18,446	16,935	82,355	140,549	128,672	3.65	3.43	3.21
New Mexico.....	6,393	10,781	10,881	2,911	5,089	4,545	9,304	15,870	15,426	.41	.39	.38
New York.....	194,049	329,951	303,323	26,656	41,922	39,159	220,705	371,873	342,482	9.78	9.07	8.53
North Carolina.....	33,922	55,341	49,364	9,309	15,691	14,286	43,231	71,032	63,650	1.92	1.73	1.58
North Dakota.....	8,620	12,060	11,095	2,463	3,193	2,680	11,083	15,253	13,775	.49	.37	.34
Ohio.....	105,439	250,192	244,865	15,261	28,440	30,028	120,700	278,632	274,893	5.35	6.79	6.84
Oklahoma.....	34,343	51,580	56,605	8,956	14,702	14,737	43,299	66,282	71,342	1.92	1.62	1.78
Oregon.....	18,769	35,915	40,460	4,064	7,859	8,050	22,833	43,774	48,510	1.01	1.07	1.21
Pennsylvania.....	140,332	293,909	273,281	21,044	39,150	41,919	161,376	333,059	315,200	7.15	8.12	7.85
Rhode Island.....	10,483	20,500	19,309	1,531	2,749	2,594	12,014	23,249	21,903	.53	.57	.55
South Carolina.....	15,748	26,959	24,020	4,305	7,257	6,091	20,053	34,216	30,111	.89	.83	.75
South Dakota.....	7,911	12,728	13,556	2,003	2,659	2,962	9,914	15,387	16,518	.44	.38	.41
Tennessee.....	24,973	42,320	41,959	6,476	10,799	11,062	31,449	53,119	53,021	1.39	1.29	1.32
Texas.....	103,817	150,093	157,995	25,882	40,905	38,903	129,699	190,998	196,898	5.76	4.66	4.91
Utah.....	7,045	14,358	14,398	1,984	3,298	3,571	9,029	17,656	17,969	.40	.43	.45
Vermont.....	4,687	8,799	8,413	1,228	2,444	2,308	5,915	11,243	10,721	.26	.27	.27
Virginia.....	31,204	50,768	50,346	7,906	12,928	12,904	39,110	63,696	63,250	1.73	1.55	1.57
Washington.....	23,935	49,699	54,458	5,416	10,222	10,666	28,351	59,921	65,124	1.30	1.46	1.62
West Virginia.....	16,483	35,679	37,272	4,694	9,269	9,181	21,177	44,948	46,453	.94	1.10	1.16
Wisconsin.....	48,872	97,241	89,569	8,516	16,412	16,237	57,388	113,652	105,806	2.54	2.77	2.63
Wyoming.....	5,136	8,968	9,693	1,708	2,627	2,661	6,844	11,595	12,354	.30	.28	.31
Total.....	1,891,021	3,483,752	3,404,497	365,349	618,249	611,644	2,256,370	4,102,001	4,016,141	100.00	100.00	100.00

\* Data from R. L. Polk & Co.

# U. S. and WORLD REGISTRATIONS

## World Motor Vehicle Registration by Years

	1932	1933	1934	1935	1936	1937	1938
Africa	369,814	383,227	425,573	466,603	562,892	619,867	655,755
America (less U.S.A.)	1,896,380	1,827,754	1,860,135	1,917,676	2,001,459	2,105,190	2,214,318
Asia	486,292	506,925	546,201	597,601	625,718	666,719	666,550
Europe	5,498,704	6,052,758	6,656,012	7,136,425	7,791,665	8,455,577	9,065,475
Oceania	740,016	778,856	826,711	890,669	972,059	1,052,511	1,128,637
Total	8,991,206	9,549,520	10,314,632	11,008,974	11,953,793	12,899,864	13,730,735
United States†	24,341,822	23,849,932	24,881,467	26,225,757	28,091,709	29,649,270	29,211,652
World Total	33,333,028	33,399,452	35,196,099	37,234,731	40,045,502	42,549,134	42,942,387

†AUTOMOTIVE INDUSTRIES, all others *The American Automobile* (Overseas Edition).

## U. S. Motor Vehicle Registrations by States

(As of December 31, 1938 and 1937)

STATE	Passenger Cars *		Trucks		Buses		Total Registered Motor Vehicles	Per Cent Change	Per Cent of Total	Persons per Motor Vehicle†
	1938	1937	1938	1937	1938	1937				
Alabama	239,178	246,598	50,780	53,070	463	458	290,421	300,126	- 3.3	1.00
Arizona	105,447	105,869	22,998	22,973	346	368	128,791	129,210	- 0.5	.44
Arkansas	167,262	174,277	53,789	59,263	362	348	221,413	233,888	- 5.4	.76
California (6)	2,339,208	2,319,341	170,483	164,132	(a)	(a)	2,509,691	2,483,473	+ 1.0	8.52
Colorado	303,377	304,400	31,447	32,795	1,093	1,043	335,917	338,238	- 0.7	1.15
Connecticut	368,351	367,119	63,910	68,070	1,029	1,060	433,290	436,249	- 0.7	1.49
Delaware	53,800	53,285	10,500	10,314	(a)	(a)	64,300	63,599	+ 1.1	.22
District of Columbia	149,224	163,886	14,267	18,862	1,378	1,371	164,869	184,119	- 10.5	.57
Florida	350,222	350,079	70,043	70,308	2,249	754	422,514	421,141	+ 0.3	1.45
Georgia	357,642	363,641	76,154	78,803	2,583	.....	436,379	442,444	- 1.4	1.50
Idaho	109,616	113,477	27,809	28,208	.....	128	137,425	141,813	- 3.1	.47
Illinois	1,567,775	1,556,702	222,582	220,639	(a)	(a)	1,790,357	1,777,341	+ 0.7	6.14
Indiana	793,969	814,564	122,168	140,292	1,149	1,160	917,286	956,016	- 4.1	3.14
Iowa	650,133	656,090	92,884	86,636	(a)	(a)	743,017	742,726	- 2.55	2.51
Kansas	476,241	483,293	97,744	93,046	.....	346	573,985	586,685	- 2.2	1.97
Kentucky	346,940	344,542	63,676	59,341	648	.....	411,264	403,883	+ 1.8	1.41
Louisiana	245,274	247,690	77,009	80,630	.....	(b)	322,283	328,320	- 1.9	1.10
Maine	155,000	157,596	40,000	43,171	.....	140	195,000	200,907	- 3.0	.67
Maryland (1)	339,986	331,509	53,926	52,014	1,009	.....	394,921	383,523	+ 2.9	1.35
Massachusetts	733,759	737,998	104,134	104,316	4,715	4,927	842,608	847,241	- 0.6	2.89
Michigan	1,269,204	1,362,769	139,631	146,117	(a)	.....	1,408,835	1,508,886	- 6.6	4.83
Minnesota	705,019	704,155	115,970	117,632	252	282	821,241	822,069	- 0.2	2.81
Mississippi	165,000	171,507	51,000	53,072	(b)	(b)	216,000	224,579	- 3.8	.74
Missouri	705,000	701,438	135,000	134,457	.....	.....	840,000	835,895	+ 0.5	2.88
Montana	130,188	133,811	41,138	40,081	.....	(a)	171,326	173,892	- 1.5	.59
Nebraska	345,500	351,184	63,500	63,667	.....	190	409,000	415,041	- 1.5	1.40
Nevada	31,500	32,563	7,650	8,092	(a)	.....	39,150	40,655	- 3.7	.13
New Hampshire	97,635	100,510	23,597	23,768	(a)	.....	121,232	124,278	- 2.5	.42
New Jersey	862,899	854,667	131,950	134,458	5,069	5,372	999,918	994,497	+ 0.5	3.43
New Mexico	92,262	90,583	26,915	31,117	976	(b)	120,153	121,700	- 1.3	.41
New York	2,227,839	2,220,379	326,808	333,543	(c) 33,942	(c) 32,832	2,588,589	2,586,754	+ 0.1	8.87
North Carolina	449,186	446,454	74,211	73,383	843	696	524,240	520,533	+ 0.7	1.80
North Dakota	141,111	141,018	33,061	32,084	84	86	174,256	173,188	+ 0.6	.60
Ohio (2) (3)	1,489,000	1,695,648	170,800	180,484	.....	(a)	1,659,800	1,876,132	- 11.6	5.69
Oklahoma	438,874	446,083	92,943	98,675	(c) 2,204	(c) 2,505	534,021	547,263	- 2.5	1.83
Oregon	296,837	298,971	59,829	60,660	655	718	357,321	360,349	- 0.9	1.22
Pennsylvania	1,743,842	1,751,488	255,654	257,330	5,451	6,062	2,004,947	2,014,880	- 0.5	6.87
Rhode Island	149,715	148,633	20,101	19,768	411	438	170,227	168,839	+ 0.8	.58
South Carolina (4)	237,857	239,793	41,379	39,835	(b)	(b)	279,236	279,628	- 0.1	.96
South Dakota	153,000	155,856	28,000	28,768	95	93	181,095	184,717	- 2.0	.62
Tennessee (5)	326,871	341,186	58,744	58,736	(b)	482	385,615	400,384	- 3.7	1.32
Texas	1,186,022	1,164,050	316,757	294,639	876	788	1,503,655	1,459,477	+ 3.0	5.15
Utah	120,530	105,043	22,432	21,094	710	478	143,672	126,615	+ 13.3	.44
Vermont	78,265	78,273	9,042	9,029	95	105	87,402	87,407	.30	.29
Virginia	366,504	363,997	66,410	67,547	672	641	433,586	432,185	+ 0.3	1.49
Washington	439,232	450,143	83,204	84,577	912	763	523,348	535,483	- 2.3	1.79
West Virginia	215,784	245,440	43,785	44,558	589	626	260,158	290,624	- 10.5	.89
Wisconsin	700,865	714,754	135,413	145,822	580	.....	836,858	860,576	- 2.8	2.87
Wyoming	63,176	64,434	17,589	17,368	275	(b)	81,040	81,802	+ 0.2	.28
<b>TOTAL</b>	<b>25,081,121</b>	<b>25,476,786</b>	<b>4,058,815</b>	<b>4,107,244</b>	<b>71,716</b>	<b>65,240</b>	<b>29,211,652</b>	<b>29,649,270</b>	<b>- 1.4</b>	<b>100.00</b>
										<b>4.43%</b>

\* Includes taxicabs.

† Based on Census Bureau estimate of population as of July 1, 1937.

‡ Average.

(a) Included with trucks.

(b) Included with passenger cars.

(c) Includes taxicabs.

(1) From April 1 to December 31 for 1937, and from October 1, 1937 to September 30, 1938 for 1938.

(2) Nine months data, April 1, 1938 to December 31, 1938, transfers deducted.

(3) Twelve months data, April 1, 1937 to March 31, 1938, transfers included.

(4) To October 31, 1938.

(5) To November 30, 1938.

(6) Passenger cars include approximately 130,000 light commercial vehicles.

For State Gasoline Taxes and Registration Fees see page 205

## U. S. and WORLD

## U. S. Motor Vehicle Registrations by Years

## Motorcycle and Trailer Registrations

(As of Dec. 31, 1938 and 1937)

State	Motorcycles		Trailers and Semitrailers		Passenger Cars	Trucks and Buses	Total Motor Vehicles	Per Cent Increase
	1938	1937	1938	1937				
Alabama	773	830	4,113	4,850	1895	4	4	..
Arizona	452	423	4,567	4,321	1896	16	16	..
Arkansas	517	507	10,477	12,278	1897	90	90	..
California	11,240	11,280	142,257	132,932	1898	800	800	..
Colorado	1,284	1,316	1,440	1,468	1899	3,200	3,200	..
Connecticut	1,789	1,996	5,356	4,904	1900	8,000	8,000	..
Delaware	250	236	2,800	2,645	1901	14,800	14,800	..
District of Columbia	725	708	2,300	2,152	1902	23,000	23,000	..
Florida	1,496	1,244	17,056	16,238	1903	32,920	32,920	..
Georgia	1,371	1,085	12,747	12,252	1904	54,590	410	55,000
Idaho	548	564	17,999	18,645	1905	77,400	600	78,000
Illinois	6,848	5,827	23,396	23,210	1906	105,900	1,100	107,000
Indiana	4,543	4,092	59,248	61,102	1907	140,300	1,700	142,000
Iowa	2,624	2,292	24,804	6,887	1908	194,400	3,100	197,500
Kansas	1,084	986	6,728	5,862	1909	305,950	6,050	312,000
Kentucky	1,116	951	(2)	(2)	1910	458,500	10,000	468,500
Louisiana	1,027	834	13,054	14,321	1911	619,500	20,000	639,500
Maine	850	874	9,600	9,751	1912	902,600	41,400	944,000
Maryland	1,437	1,549	4,129	3,422	1913	1,194,262	63,800	1,258,062
Massachusetts	767	1,189	13,108	11,311	1914	1,625,739	85,600	1,711,339
Michigan	4,295	4,078	141,772	133,863	1915	2,309,666	136,000	2,445,666
Minnesota	2,226	2,074	31,033	29,704	1916	3,297,996	215,000	3,512,996
Mississippi	225	234	1,975	2,078	1917	4,657,340	326,000	4,983,340
Missouri	1,725	1,712	32,000	31,055	1918	5,621,617	525,000	6,146,617
Montana	456	457	2,953	2,812	1919	6,771,074	794,372	7,565,446
Nebraska	1,000	985	30,100	30,091	1920	8,225,859	1,006,082	9,231,941
Nevada	102	113	1,250	1,262	1921	9,346,195	1,118,520	10,464,715
New Hampshire	896	963	4,697	4,471	1922	10,864,128	1,375,725	12,239,853
New Jersey	4,757	4,674	7,276	6,692	1923	13,479,608	1,612,569	15,092,177
New Mexico	398	337	2,569	2,690	1924	15,460,649	2,134,724	17,595,373
New York	11,427	10,230	41,652	36,213	1925	17,496,420	2,440,854	19,937,274
North Carolina	1,705	1,449	42,317	40,129	1926	19,237,171	2,764,222	22,001,393
North Dakota	298	262	849	816	1927	20,219,224	2,914,019	23,133,243
Ohio	8,900	8,194	101,900	119,269	1928	21,379,125	3,113,999	24,493,124
Oklahoma	1,080	1,143	25,500	28,471	1929	23,121,589	3,379,854	26,501,443
Oregon	1,531	1,559	(2)	(2)	1930*	23,183,241	3,473,831	26,657,072
Pennsylvania	11,441	10,864	27,052	26,889	1931*	22,567,381	3,426,515	25,993,896
Rhode Island	809	724	654	571	1932*	21,139,092	3,202,730	24,341,822
South Carolina	1,021	785	4,707	5,716	1933*	20,557,493	3,292,439	23,849,932
South Dakota	415	419	18,180	20,121	1934*	21,535,199	3,346,268	24,881,467
Tennessee	1,464	1,473	(2)	(2)	1935*	22,630,715	3,595,042	26,225,757
Texas	3,980	3,667	50,944	47,162	1936*	24,161,820	3,929,889	28,091,709
Utah	444	439	591	953	1937*	25,081,121	4,130,531	29,211,652
Vermont	450	491	1,835	1,706				—1.4
Virginia	1,685	1,880	8,075	6,730				0.2
Washington	2,025	2,055	17,826	16,031				—2.5
West Virginia	991	1,161	2,640	3,164				—6.4
Wisconsin	3,346	3,240	5,047	5,411				—2.0
Wyoming	275	281	10,209	10,099				
Total	110,126	104,686	991,752	960,700				

(2) Included with trucks.

AUTOMOTIVE INDUSTRIES count, all others Bureau of Public Roads.

## U. S. Registrations 68 Per Cent of World

	Motor Vehicles	Cars*	Trucks*	Buses*	Motorcycles*
Africa	655,755	521,696	131,234	**	54,820
Americas (less U. S. A.)	2,214,628	1,747,065	431,927	35,764	25,270
Asia	666,550	413,268	174,397	76,835	101,958
Europe	9,065,475	6,301,266	2,493,241	145,948	2,507,180
Oceania	1,128,637	840,259	286,797	981	100,818
Total	13,731,043	9,823,594	3,517,496	259,518	2,790,046
United States	29,211,652	25,081,121	4,058,815	71,716	110,128
World Total, 1938	42,942,695	34,904,715	7,576,311	331,234	2,900,172
World Total, 1937	42,549,134	34,659,106	7,435,208	325,325	2,753,585

\*Automotive Industries count. All others The American Automobile (Overseas Edition).

\*\* Included with trucks.

\*Incomplete for all territories.

# REGISTRATIONS

By Special Arrangement with the  
American Automobile (Overseas Edition)

## THE AMERICAS

COUNTRY	Motor Vehicles	Cars	Trucks	Buses	Motor-cycles
Alaska	3,750	2,500	1,250	...	28
Antigua	314	249	59	6	21
Argentina	279,267	209,896	57,871	11,500	2,000
Bahamas	1,650	1,450	200	a	46
Barbados	2,544	2,107	333	104	95
Bermuda	60	3	51	6	...
Bolivia	2,160	957	1,064	139	...
Brazil	160,000	100,800	54,900	4,300	1,630
British Guiana	1,700	1,400	250	50	175
British Honduras	246	134	112	...	2
Canada	1,381,103	1,161,069	217,603	2,431	12,034
Chile	45,781	31,783	12,469	1,529	700
Colombia	24,143	13,713	7,159	3,271	252
Costa Rica	3,283	2,263	787	233	182
Cuba	42,658	26,789	13,051	2,818	347
Dominica	83	60	23	...	12
Dominican Republic	2,650	1,750	900	...	180
Dutch Guiana	200	140	50	10	30
Ecuador	4,176	1,758	1,939	479	85
French Guiana	347	148	201	...	6
Grenada	560	400	150	10	65
Guadeloupe	2,250	1,775	405	70	90
Guatemala	4,175	2,600	1,575	...	425
Haiti	2,427	1,992	435	a	61
Honduras	1,225	697	519	9	7
Jamaica	12,548	9,691	2,699	158	561
Marinique	2,975	2,320	555	100	120
Mexico	99,470	75,170	18,130	6,170	3,350
Montserrat	112	87	25	...	4
North West Indies	3,851	2,460	888	303	191
Newfoundland	5,024	3,931	1,093	...	178
Nicaragua	842	615	199	28	63
Panama	12,250	10,850	1,400	...	61
Paraguay	2,100	1,500	600	...	...
Peru	18,690	11,332	6,306	1,052	339
Puerto Rico	21,500	16,500	5,000	...	185
St. Lucia	188	153	20	15	22
St. Pierre-Miquelon	102	38	64	...	7
St. Vincent	249	190	29	30	24
Salvador	3,095	2,310	425	360	539
Trinidad and Tobago	8,750	6,000	2,200	550	1,000
United States	29,211,652	25,081,121	4,058,815	71,716	110,126
Uruguay	28,990	21,750	7,240	...	...
Venezuela	26,300	15,000	11,300	...	150
Virgin Islands	728	482	223	23	3
West Indies (Other)	350	275	75	...	...

a—Included with cars.

\* Not complete for all territories. † Not including United States.

## EUROPE

COUNTRY	Motor Vehicles	Cars	Trucks	Buses	Motor-cycles
Albania	970	404	442	124	35
Azores	888	744	44	100	129
Belgium	226,907	148,221	78,228	2,460	67,946
Bulgaria	4,400	2,700	1,700	...	1,500
Czechoslovakia	64,981	47,974	15,246	1,761	34,000
Danzig	3,555	2,650	850	55	2,000
Denmark	150,778	108,201	42,577	...	29,324
Estonia	8,360	3,220	2,850	290	2,840
Faroë Islands	110	27	58	25	7
France	2,250,000	1,750,000	500,000	...	...
Finland	47,737	26,850	17,875	3,012	6,350
Germany	1,707,496	1,305,608	381,096	20,792	1,582,872
Gibraltar	1,155	925	190	40	...
Great Britain	2,542,294	1,916,226	538,532	87,536	436,231
Greece	13,800	6,500	5,100	2,200	1,000
Holland	153,750	97,000	56,750	...	57,000
Hungary	22,050	17,250	4,900	...	10,000
Iceland	1,870	800	1,070	...	...
Ireland	63,000	51,500	11,500	...	3,200
Italy	399,375	303,600	85,875	9,900	154,500
Latvia	6,850	3,500	3,000	350	2,500
Lithuania	2,730	1,790	570	370	1,380
Malta	5,259	3,800	833	626	401
Monaco	1,850	1,450	400	...	150
Northern Ireland	48,134	37,224	9,440	1,470	2,918
Norway	89,653	54,183	31,980	3,490	15,224
Poland	41,948	29,768	10,144	2,038	12,061
Portugal	48,330	35,400	11,280	1,650	4,620
Romania	27,750	20,500	7,250	...	1,300
Spain	125,000	...	...	...	...
Sweden	215,000	152,000	57,950	5,050	43,800
Switzerland	94,850	72,500	20,650	1,700	26,000
U. S. S. R. (Russia)	677,997	85,387	592,610	...	...
Yugoslavia	18,648	13,386	4,353	909	7,892

Total 1938..... 9,065,475 6,301,288 2,493,241 145,948 2,507,180

Total 1937 (Revised).... 8,455,577 \*5,844,596 \*2,337,843 \*148,338 \*2,373,057

\* Not complete for all territories.

## AFRICA

COUNTRY	Motor Vehicles	Cars	Trucks	Buses	Motor-cycles
Algeria	68,700	59,000	9,700	...	4,400
Angola	3,250	1,250	2,000	...	235
Basutoland	900	700	200	...	...
Bechuanaland	600	425	175	...	...
Belgian Congo	6,652	3,172	3,480	...	1,615
British East Africa	25,399	16,512	8,887	...	2,187
British Somaliland	253	41	212	...	...
British West Africa	15,769	6,054	9,715	...	795
Canary Islands	5,975	3,725	2,250	...	...
Egypt	34,825	29,525	5,300	...	2,875
French Equatorial Africa	1,265	527	738	...	225
French West Africa	15,803	6,161	9,642	...	1,285
French Somaliland	325	...	...	...	15
Italian East Africa	2,500	...	...	...	...
Liberia	125	75	50	...	...
Madeira	1,175	780	395	...	20
Madagascar	7,444	5,214	2,230	...	2,802
Mauritius	2,642	2,121	521	...	...
Morocco	61,468	46,363	15,105	...	5,642
Nyasaland	1,462	872	590	...	503
Portuguese East Africa	8,351	3,457	2,894	...	771
Rhodesia	22,500	17,500	5,000	...	1,800
Seychelles	161	135	26	...	91
South West Africa	4,300	3,000	1,300	...	100
Sudan	4,500	3,250	2,250	...	...
Swaziland	560	435	125	...	...
Tangier	784	631	153	...	39
Tripolitania	1,505	1,230	275	...	170
Tunisia	19,478	16,060	3,418	...	1,770
Union of South Africa	339,084	294,481	44,603	...	27,500

Total 1938..... 655,755 \*521,696 \*131,234 \*54,820

Total 1937 (Revised).... 619,887 \*494,537 \*122,505 \*54,728

\* Not complete for all countries.

## ASIA

COUNTRY	Motor Vehicles	Cars	Trucks	Buses	Motor-cycles
Afghanistan	2,400	400	2,000	...	...
Arabia	2,725	1,696	980	55	23
British Malaya	45,748	33,862	11,886	...	4,220
Ceylon	28,044	21,102	4,307	2,635	2,999
China	44,750	23,750	13,500	7,500	...
Chosen	9,500	2,600	3,900	3,000	1,800
Cyprus	2,050	...	...	...	467
French Indo China	20,530	16,235	4,295	...	733
Hongkong	4,665	3,611	1,054	...	285
India	178,124	127,478	20,333	30,313	11,417
Iran	11,522	3,772	7,380	370	250
Iraq	6,441	4,169	2,272	...	132
Japanese Empire	140,000	65,000	55,000	20,000	62,000
Macau	400	220	180	...	...
Manchukuo	4,550	1,800	2,050	700	190
Netherlands East Indies	73,777	51,819	12,615	9,343	12,968
Palestine	9,630	5,900	2,750	980	1,410
Philippine Islands	50,000	31,500	18,500	...	500
Siam	10,850	5,900	4,250	700	770
Syria	10,859	8,716	1,661	482	777
Trans Jordan	501	301	167	33	16
Turkey	9,484	3,443	5,317	724	1,000

Total 1938..... 666,550 \*413,268 \*174,387 \*76,835 \*101,958

Total 1937 (Revised).... 666,719 \*401,962 \*181,944 \*80,763 \*98,441

\* Not complete for all countries. † Included in trucks. †† Included in cars.

## OCEANIA

COUNTRY	Motor Vehicles	Cars	Trucks	Buses	Motor-cycles
Australia	799,750	578,000	221,750	...	80,250
Cook Islands	84	41	43	...	5
Fiji Islands	1,747	1,050	434	263	107
French Oceania	500	350	150	...	75
Hawaii	60,000	48,500	11,500	...	600
New Guinea	600	375	225	...	35
New Zealand	285,028	211,792	52,546	690	19,733
Other Oceania	600	...	...	...	...
Samoa	328	151	149	28	13

Total 1938..... 1,128,637 \*840,259 \*286,797 \*981 \*100,618

Total 1937 (Revised).... 1,052,511 \*786,983 \*263,542 \*1,486 \*102,271

\* Not complete for all territories. † Included with trucks.

## Passenger Car Representations by Makes—By Years\*

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Buick .....	3,533	3,241	3,003	2,608	2,472	2,273	2,303	2,465	2,516	2,750	2,657
Cadillac-La Salle .....	762	722	700	654	602	563	541	649	648	803	695
Chevrolet .....	8,987	9,553	9,558	9,412	9,039	8,885	8,578	8,667	8,776	8,752	8,406
Chrysler .....	3,647	3,337	3,007	3,454	2,999	3,511	4,360	4,309	4,097	3,837	3,383
De Soto .....	307	1,133	1,369	1,234	1,252	1,359	1,880	3,406	2,888	2,926	2,688
Dodge .....	3,212	2,994	2,842	2,663	2,722	2,772	3,297	3,772	4,087	4,380	4,113
Ford .....	8,731	8,598	8,833	8,735	8,280	7,480	7,388	7,948	8,301	8,245	7,825
Graham .....	1,492	1,751	1,469	1,206	1,079	920	782	1,120	958	877	611
Hudson .....	3,508	3,488	2,863	2,270	1,761	1,842	2,641	3,023	3,263	3,390	2,681
Hupmobile .....	1,265	1,296	1,084	991	854	699	763	771	.....	302	191
Lincoln Zephyr .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,695
Nash .....	1,986	2,123	1,884	1,677	1,430	1,201	1,283	1,400	1,314	1,753	1,533
Oldsmobile .....	1,656	1,668	1,592	1,426	1,351	1,418	1,611	2,227	2,454	2,588	2,493
Packard .....	762	776	721	682	624	540	486	843	1,128	1,283	1,098
Plymouth .....	.....	.....	7,218	7,351	6,276	7,642	9,537	11,487	11,072	11,143	10,184
Pontiac .....	4,386	4,545	3,435	2,887	2,503	2,336	2,314	2,791	3,413	4,006	3,411
Studebaker .....	2,262	2,242	1,971	1,999	1,927	1,733	1,986	1,832	2,080	2,335	1,873
Willys-Overland .....	4,669	4,751	3,783	2,904	2,739	.....	.....	580	1,476	1,143	.....
Total .....	51,165	52,218	55,332	52,153	47,910	45,174	49,750	56,710	57,575	60,846	56,680
Miscellaneous .....	11,707	10,836	7,409	7,020	5,527	4,854	3,852	3,046	1,779	2,289	366
<b>Total Representations..</b>	<b>62,872</b>	<b>63,054</b>	<b>62,741</b>	<b>59,173</b>	<b>53,437</b>	<b>50,028</b>	<b>53,602</b>	<b>59,756</b>	<b>59,354</b>	<b>63,135</b>	<b>57,046</b>

\* Chilton Trade List Count as of the end of each year.

Note—The term "Passenger car representation" refers to retail outlets of any given make. A dealer organization often handles more than one make of passenger car.

## Automotive Sales Outlets by States\*

STATE	Total Registered Motor Vehicles 1938	WHOLESAVERS		DEALERS				REPAIR SHOPS			Motor Vehicles Per Retail Outlet	All Truck Fleets (8 or more Trucks)	
		Number of Wholesalers	Motor Vehicles Per Wholesaler	Passenger Car Dealers	Exclusive Truck Dealers	Total Car and Truck Dealers	Total Truck Dealers	Motor Vehicles Per Car and Truck Dealer	Car Dealer Service Stations	Independent Repair Shops	Total Repair Shops		
Alabama .....	290,421	69	4,209	331	19	350	281	829	245	289	634	670	433
Arizona .....	128,791	27	4,770	144	5	149	97	864	142	167	309	331	90
Arkansas .....	221,413	77	2,875	425	28	453	329	488	433	519	952	985	224
California .....	2,509,691	497	5,050	1,938	110	2,048	1,368	1,225	1,912	5,071	6,983	7,479	335
Colorado .....	335,917	67	4,983	439	28	467	313	715	451	527	978	1,025	250
Connecticut .....	433,290	100	4,333	579	27	606	349	715	580	782	1,362	1,496	289
Delaware .....	64,300	13	4,946	87	2	89	28	722	77	103	180	200	321
District of Columbia .....	164,869	26	6,341	94	3	97	35	1,699	87	152	239	260	227
Florida .....	422,514	102	4,142	478	33	511	340	826	501	548	1,049	1,102	383
Georgia .....	436,379	94	4,642	498	25	523	403	834	520	325	845	882	494
Idaho .....	137,425	26	5,285	311	19	330	221	416	321	187	508	532	258
Illinois .....	1,790,357	380	4,711	2,271	116	2,387	1,544	750	2,340	2,866	5,206	5,362	333
Indiana .....	917,286	187	4,905	1,235	42	1,277	776	718	1,243	1,231	2,474	2,525	363
Iowa .....	743,017	158	4,702	1,494	111	1,605	1,111	462	1,534	1,442	2,876	3,181	233
Kansas .....	573,985	122	4,704	1,032	63	1,095	745	524	1,047	986	2,033	2,084	275
Kentucky .....	411,264	100	4,113	701	24	725	462	567	711	489	1,200	1,222	336
Louisiana .....	322,283	67	4,810	347	27	374	266	861	367	316	683	708	455
Maine .....	195,000	45	4,333	396	21	417	249	467	412	423	835	841	231
Maryland .....	394,921	74	5,336	447	15	462	178	854	438	563	1,001	1,075	357
Massachusetts .....	842,608	216	3,900	1,156	39	1,195	587	705	1,142	1,267	2,409	2,614	322
Michigan .....	1,408,835	232	6,072	1,740	50	1,790	1,122	787	1,740	1,746	3,486	3,647	386
Minnesota .....	821,241	107	7,675	1,477	40	1,517	825	541	1,468	1,527	2,995	31,04	264
Mississippi .....	216,000	57	3,789	343	30	373	290	579	366	211	577	587	367
Missouri .....	840,000	184	4,565	984	33	1,017	651	825	961	1,583	2,544	2,752	305
Montana .....	171,326	37	4,630	387	47	434	341	394	427	268	695	728	235
Nebraska .....	409,000	91	4,494	764	38	802	636	509	786	859	1,645	1,725	237
Nevada .....	39,150	11	3,559	120	3	123	89	318	114	97	211	234	33
New Hampshire .....	121,232	25	4,849	254	13	267	166	454	259	262	521	536	226
New Jersey .....	999,918	177	5,649	1,052	49	1,101	618	908	1,017	1,928	2,945	3,119	320
New Mexico .....	120,153	23	5,224	159	10	169	133	710	163	144	307	324	48
New York .....	2,568,589	543	4,767	2,864	160	3,024	1,860	856	2,841	5,453	8,294	8,791	294
North Carolina .....	524,240	108	4,854	660	21	681	368	769	653	605	1,258	1,347	389
North Dakota .....	174,256	30	5,808	517	27	544	373	320	527	480	1,007	1,066	163
Ohio .....	1,659,800	380	4,367	2,349	108	2,457	1,445	675	2,201	2,329	4,530	4,744	349
Oklahoma .....	534,021	111	4,811	803	26	829	568	644	742	762	1,504	1,742	306
Oregon .....	357,321	68	5,254	453	17	470	345	760	462	824	1,286	1,332	268
Pennsylvania .....	2,004,947	384	5,221	3,135	154	3,289	1,995	609	3,109	4,085	7,194	7,630	2,195
Rhode Island .....	170,227	29	5,869	156	7	163	112	1,044	147	288	435	480	354
South Carolina .....	279,236	45	6,205	346	15	361	233	773	354	229	583	626	446
South Dakota .....	181,095	31	5,841	408	23	431	349	420	425	381	806	846	214
Tennessee .....	385,615	96	4,016	423	24	447	367	862	436	436	872	906	425
Texas .....	1,503,655	311	4,834	2,005	185	2,190	1,367	686	2,090	2,934	5,024	5,198	783
Utah .....	143,672	39	3,680	210	14	224	140	640	215	231	446	466	308
Vermont .....	87,402	24	3,641	224	11	235	128	371	227	350	577	586	41
Virginia .....	433,586	75	5,781	672	31	703	368	618	761	848	1,609	1,647	263
Washington .....	523,348	132	3,964	727	37	764	682	685	742	1,266	2,008	2,099	396
West Virginia .....	260,158	75	3,468	489	27	516	319	504	510	375	885	909	286
Wisconsin .....	836,858	133	6,292	1,620	92	1,712	1,208	488	1,681	1,499	3,180	3,311	252
Wyoming .....	81,040	14	5,788	192	7	199	129	407	189	153	342	362	65
<b>Total .....</b>	<b>29,211,652</b>	<b>6,019</b>	<b>4,853<sup>†</sup></b>	<b>39,936</b>	<b>2,056</b>	<b>41,992</b>	<b>26,909</b>	<b>694<sup>†</sup></b>	<b>40,216</b>	<b>50,406</b>	<b>90,622</b>	<b>95,418</b>	<b>305<sup>†</sup></b>

<sup>†</sup> Average. \* Chilton Trade List count as of January, 1939.

## Car Dealer Representation by States—By Makes\*

STATES	Buick	Cadillac-La Salle	Chevrolet	Chrysler	De Soto	Dodge	Ford	Graham	Hudson-Terraplane	Hupmobile	Lincoln-Zephyr	Nash	Oldsmobile	Packard	Plymouth	Pontiac	Studebaker	Willys	Miscellaneous	Total
Alabama	20	10	93	19	18	34	92		19	14	9	19	5	71	28	10	5	4	472	
Arizona	14	6	29	19	13	19	30	2	7	1	2	7	3	42	17	11	2	3	229	
Arkansas	24	1	117	25	20	42	95	2	15	4	5	11	15	65	159	141	7	4	593	
California	158	51	313	149	150	219	339	49	113	8	244	65	159	65	518	159	141	21	3,010	
Colorado	31	3	97	43	24	43	93	9	34	3	8	15	23	13	110	30	21	9	612	
Connecticut	40	19	84	57	50	58	81	26	45	11	35	27	41	24	165	53	36	15	874	
Delaware	5	4	15	4	5	6	13		4	2	4	6	2	15	8	4	1	1	99	
District of Columbia	2	1	10	8	11	8	19		9	1	8	1	3	7	27	5	7	4	135	
Florida	29	18	94	47	23	50	103	5	39	2	39	11	32	20	120	46	22	28	744	
Georgia	28	7	133	37	17	56	148		21		13	8	24	15	110	23	17	17	676	
Idaho	20	1	67	26	23	36	54	7	33	2	9	12	22	6	85	20	23	8	454	
Illinois	177	41	463	171	162	220	437	41	139	20	127	114	139	75	553	197	110	72	3,272	
Indiana	96	22	239	88	91	112	219	15	94	7	72	39	96	27	291	111	73	34	1,738	
Iowa	107	14	424	126	70	141	315	14	96	6	63	50	93	29	337	133	52	30	2,104	
Kansas	60	7	245	79	69	97	228	3	96		27	31	60	13	245	82	28	6	1,404	
Kentucky	48	9	131	62	35	84	135	8	42	1	23	16	49	17	181	64	30	20	962	
Louisiana	20	6	87	32	20	36	90		20	1	7	8	16	6	88	22	10	4	473	
Maine	19	8	79	31	22	33	81	8	29	1	3	31	18	8	86	43	19	7	526	
Maryland	27	6	72	48	34	55	83	9	33		14	12	27	14	137	40	24	8	648	
Massachusetts	64	36	178	97	102	132	168	33	99	10	28	73	92	54	331	126	56	34	1,717	
Michigan	128	38	363	120	88	188	329	35	165	15	74	72	127	57	396	187	68	44	2,515	
Minnesota	112	7	369	152	76	149	308	16	92	8	10	54	61	20	377	117	62	35	2,031	
Mississippi	19	5	106	31	18	40	92		9		10	8	14	8	89	30	4	4	490	
Missouri	56	8	282	71	72	100	218	6	33		22	27	47	25	243	74	26	8	1,344	
Montana	19	6	91	38	12	49	85	4	26	1	5	20	28	11	99	30	31	6	565	
Nebraska	46	4	214	75	50	72	187	5	39	1	18	21	30	8	197	43	29	18	1,057	
Nevada	14	1	25	10	7	13	26	2	9	1	4	10	7	2	30	12	9	5	188	
New Hampshire	16	4	56	17	17	27	51	6	23	1	12	15	9	61	20	8	8	3	354	
New Jersey	68	40	162	92	83	108	172	25	63	6	29	50	77	34	283	96	66	30	1,502	
New Mexico	17	3	35	16	11	13	36	2	13	1	8	4	12	5	40	16	8	1	241	
New York	178	78	484	264	217	321	496	52	191	18	138	122	215	110	802	267	140	103	4,216	
North Carolina	51	12	155	67	37	67	154	2	49		8	9	2	38	19	171	69	21	11	945
North Dakota	22	3	149	48	26	44	144	1	47	2	1	16	13	4	118	20	20	9	691	
Ohio	144	40	432	188	192	228	378	59	180	3	39	97	151	72	608	182	115	81	3,203	
Oklahoma	53	7	198	48	41	82	172	1	39		29	9	44	14	171	86	24	19	1,045	
Oregon	25	9	99	33	35	43	81	15	28	2	35	29	27	10	111	34	25	19	662	
Pennsylvania	204	60	525	303	241	320	491	68	213	20	215	177	207	119	864	267	190	119	4,625	
Rhode Island	11	6	25	17	13	15	23	2	17	1	5	9	12	8	45	10	13	3	238	
South Carolina	27	3	87	28	14	27	89	1	19	1	13	1	18	10	69	31	10	6	455	
South Dakota	23	3	124	43	32	34	119	2	15		4	9	14	5	109	20	16	5	580	
TOTAL	2,657	695	8,406	3,383	2,688	4,113	7,825	611	2,681	191	1,695	1,533	2,493	1,098	10,184	3,411	1,873	1,143	366	57,046

\*Chilton Trade List count as of January, 1939

## Car Dealer Representation by Makes and by Population Groups\*

### Population Divisions

MAKE	0-1,000	1,000-2,500	2,500-5,000	5,000-10,000	10,000-25,000	25,000-50,000	50,000-100,000	Over 100,000	Exclusive Dealers	Dealers Handling this Make and One or More Other Makes	Total Dealer Representation
Buick	282	473	508	495	463	184	99	173	1,199	1,458	2,657
Cadillac-La Salle	19	30	55	92	195	117	78	109	131	564	695
Chevrolet	3,152	2,140	1,059	700	562	185	137	471	6,657	1,749	8,406
Chrysler	665	705	515	468	451	164	97	318		3,383	3,383
De Soto	497	437	376	376	400	163	104	335		2,688	2,688
Dodge	604	871	702	584	507	187	110	348		4,113	4,113
Ford	2,598	2,035	1,027	706	552	194	166	547	5,810	2,015	7,825
Graham	55	48	48	70	132	82	52	124	405	611	611
Hudson	485	441	399	374	383	154	111	334	2,157	524	2,681
Hupmobile	18	10	14	16	29	31	28	45	87	104	191
Lincoln-Zephyr	214	325	264	237	255	89	81	230		1,695	1,695
Nash	179	183	188	230	277	134	93	249	1,168	365	1,533
Oldsmobile	258	453	445	429	415	160	101	232	1,168	1,325	2,493
Packard	39	71	121	176	292	134	66	179	634	464	1,098
Plymouth	1,986	2,013	1,593	1,428	1,348	524	311	1,001		10,184	10,184
Pontiac	459	764	627	512	492	180	103	274	2,150	1,261	3,411
Studebaker	224	209	269	297	349	154	101	270	1,392	481	1,673
Willys	172	159	155	150	178	86	67	176	545	598	1,143
Miscellaneous	38	45	28	30	43	5	27	110	23	343	366
Total	12,124	11,412	8,393	7,370	7,323	2,947	1,952	5,525	23,526	33,520	57,046
Per Cent of Total	21.3%	20.0%	14.7%	12.9%	12.8%	5.2%	3.4%	9.7%	...	...	100.0%

\*Chilton Trade List count as of January, 1939

## 1939 AMERICAN

Line Number	CAR MAKE AND MODEL	Wheelbase (In.)	Overall Length (In.)	Tread (In.)	Tire Size (In.)	Shipping Weight— 5 Pass., 4-Door Sedan	Lowest Delivered Price 5 Pass., 4-Door Sedan	ENGINE														
								No. of Cylinders, Bore and Stroke (In.)	Taxable Hp.	Piston Displacement (Cu. In.)	Maximum Brake Hp. at Specified R.P.M.	Maximum Torque (Lb.-Ft.) at Specified R.P.M.	Comp'n Ratio (to -1)	Comp'n Pressure (Lb.)	Cylinder Head Material	At What R.P.M.	Weight per Cu. In., 5 Pass., 4-Door Sedan	Weight per Cu. In., 5 Pass., 4-Door Sedan	Displacement Factor	Revolutions per Mile		
1	Bantam	60	75 <sup>1</sup> / <sub>4</sub>	129 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>2</sub> 59 <sup>1</sup> / <sub>2</sub> 6.50/16	1270	497 <sup>1</sup> / <sub>2</sub>	4-2-2x3.0	7.7	45.6	20-4000	31-2400	7.00	None	CI	125	Cra	27.85	63.50	.438	23.0 4375	
2	Buick	39-40	120	213 <sup>1</sup> / <sub>2</sub>	58 <sup>1</sup> / <sub>2</sub> 59 <sup>1</sup> / <sub>2</sub> 6.50/16	3482	996	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	30.6	248.0	107-3400	203-2000	6.10	None	CI	112	Cra	14.04	32.54	.431	39.9 3223	
3	Buick	39-60	126	208	58 <sup>1</sup> / <sub>2</sub> 59 <sup>1</sup> / <sub>2</sub> 7.00/16	3782	1246	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	37.8	320.2	141-3600	269-2000	6.25	None	CI	114	Cra	11.81	26.82	.440	42.3 2839	
4	Buick	39-80	133	218 <sup>1</sup> / <sub>2</sub>	59 <sup>1</sup> / <sub>2</sub> 62 <sup>1</sup> / <sub>2</sub> 7.00/16	4247	1513	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	37.8	320.2	141-3600	269-2000	6.25	None	CI	114	Cra	13.28	30.12	.440	39.4 2947	
5	Buick	39-90	140	225 <sup>1</sup> / <sub>2</sub>	59 <sup>1</sup> / <sub>2</sub> 62 <sup>1</sup> / <sub>2</sub> 7.00/16	4568	2074	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	37.8	320.2	141-3600	269-2000	6.25	None	CI	114	Cra	14.26	32.39	.440	38.5 3080	
6	Cadillac-V8	39-51	126	207 <sup>1</sup> / <sub>2</sub>	58 59 7.00/16	3770	1680	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	39.2	346.0	135-3400	250-1700	6.25	(e)	CI	155	1000	10.89	27.92	.390	44.5 2764	
7	Cadillac-V8	39-60S	127	214 <sup>1</sup> / <sub>2</sub>	58 61 7.00/16	4110	2090	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	39.2	346.0	135-3400	250-1700	6.25	(e)	CI	155	1000	11.87	30.44	.391	41.2 2764	
8	Cadillac-V8	39-75	141	225 <sup>1</sup> / <sub>2</sub>	60 <sup>1</sup> / <sub>2</sub> 62 <sup>1</sup> / <sub>2</sub> 7.50/16	4785	2995	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	39.2	346.0	140-3400	270-1700	6.70	(b)	CI	170	1000	13.82	34.17	.404	40.1 3100	
9	Cadillac-V16	39-90	141	222	60 <sup>1</sup> / <sub>2</sub> 62 <sup>1</sup> / <sub>2</sub> 7.50/16	5105	5140	16-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	67.6	431.0	185-3800	324-1700	6.75	6.08	CI	180	1000	11.84	27.59	.429	44.3 2918	
10	Chevrolet	Master-85	112 <sup>1</sup> / <sub>4</sub>	191 <sup>1</sup> / <sub>2</sub>	56 <sup>1</sup> / <sub>2</sub> 59 6.00/16	2805	689	6-3 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub>	29.4	216.5	85-3200	170-(e)	6.25	None	CI	.....	.....	12.85	33.00	.392	36.3 2779	
11	Chevrolet	Master De Luxe	112 <sup>1</sup> / <sub>4</sub>	190 <sup>1</sup> / <sub>2</sub>	57 <sup>1</sup> / <sub>2</sub> 59 6.00/16	2875	745	6-3 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub>	29.4	216.5	85-3200	170-(e)	6.25	None	CI	.....	.....	13.27	33.82	.392	39.0 3144	
12	Chrysler	Royal C-22	119	201 <sup>1</sup> / <sub>2</sub>	56 <sup>1</sup> / <sub>2</sub> 60 <sup>1</sup> / <sub>2</sub> 6.25/16	3265	1010	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	27.3	241.5	100-3600	.....	6.50	7.00	CI <sup>o</sup>	145	1000	13.52	32.65	.414	38.5 3018	
13	Chrysler	Imp. C-23	125	207 <sup>1</sup> / <sub>2</sub>	57 <sup>1</sup> / <sub>2</sub> 60 <sup>1</sup> / <sub>2</sub> 7.00/16	3640	1198	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	33.8	323.5	130-3400	.....	6.80	7.45	AI	155	1000	11.25	28.00	.401	42.5 2756	
14	Chrysler	Cus. Imp. C-24	144	224 <sup>1</sup> / <sub>2</sub>	58 <sup>1</sup> / <sub>2</sub> 63 <sup>1</sup> / <sub>2</sub> 7.50/16	.....	2595	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	33.8	323.5	132-3400	.....	6.80	7.45	AI	155	1000	.....	.....	.408	3317	
15	De Soto	De L. & C. S-6	119	200 <sup>1</sup> / <sub>2</sub>	56 <sup>1</sup> / <sub>2</sub> 60 <sup>1</sup> / <sub>2</sub> 6.00/16	3174	970	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	27.3	228.1	93-3600	.....	6.50	7.00	CI <sup>o</sup>	145	1000	13.91	34.12	.407	37.7 3055	
16	Dodge	Spec. & De L. D-11	117	197 <sup>1</sup> / <sub>2</sub>	56 <sup>1</sup> / <sub>2</sub> 60 <sup>1</sup> / <sub>2</sub> 6.00/16	2960	855	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	25.3	217.8	87-3600	.....	6.50	None	CI	140	1000	13.59	34.02	.399	38.3 3055	
17	Ford	V8-60	112	183	55 <sup>1</sup> / <sub>2</sub> 58 <sup>1</sup> / <sub>2</sub> 5.50/16	2525	665	8-2 <sup>1</sup> / <sub>2x3<sup>1</sup>/<sub>2</sub></sub>	21.6	136.0	60-3500	94-2500	6.60	None	AI	158	2800	18.56	42.08	.414	30.7 3423	
18	Ford	V8-85	112	189 <sup>1</sup> / <sub>2</sub>	55 <sup>1</sup> / <sub>2</sub> 58 <sup>1</sup> / <sub>2</sub> 6.00/16	2750	705	8-3 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub>	30.0	221.0	85-3800	155-2200	6.15	None	CI	140	2400	12.44	32.35	.384	38.2 2816	
19	Graham-Spec. & Cus.	96	120	203	56 <sup>1</sup> / <sub>2</sub> 61 <sup>1</sup> / <sub>2</sub> 6.00/16	3240	965	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	25.3	217.8	90-3600	160-	6.50	.....	CI	120	Cra	14.87	36.00	.413	36.8 3181	
20	Graham-S. & Cus. Sc.	97	120	203	56 <sup>1</sup> / <sub>2</sub> 61 <sup>1</sup> / <sub>2</sub> 6.25/16	3240	1095	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	25.3	217.8	116-4000	180-3000	6.70	None	AI	130	Cra	14.87	27.93	.351	3143	
21	Hudson 112	.....	90, 98	112	(k) 56 59 <sup>1</sup> / <sub>2</sub> 6.00/16	2712	806	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	21.6	175.0	86-4000	138-1400	6.50	.....	CI	115	125	15.49	31.53	.491	33.3 3062	
22	Hudson-Six	92	118	193 <sup>1</sup> / <sub>2</sub>	56 59 <sup>1</sup> / <sub>2</sub> 6.00/16	2987	898	6-3 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub>	21.6	212.0	96-3900	160-1200	6.25	.....	CI	120	125	13.66	30.17	.452	36.1 3062	
23	Hudson-C. C. Six	93	122	199 <sup>1</sup> / <sub>2</sub>	56 59 <sup>1</sup> / <sub>2</sub> 6.25/16	3023	995	6-3 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub>	21.6	212.0	101-4000	168-1200	6.25	.....	CI	120	125	14.25	29.93	.476	36.3 3025	
24	Hudson-C. C. 8	95-97	122, 129	122	(h) 56 59 <sup>1</sup> / <sub>2</sub> 6.50/16	3193	1079	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	28.8	254.5	122-4200	198-1600	6.25	.....	CI	118	125	12.54	26.17	.479	40.9 2964	
25	Hupmobile 6	R-915	115	57	60 <sup>1</sup> / <sub>2</sub> 6.00/16	.....	895	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	23.4	245.3	101-3800	168-1200	5.75	6.20	CI	107	160	.....	.....	.411	3181	
26	Hupmobile 6	922E	122	203 <sup>1</sup> / <sub>2</sub>	59 <sup>1</sup> / <sub>2</sub> 60 <sup>1</sup> / <sub>2</sub> 6.25/16	3400	995	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	23.4	245.3	101-3800	168-1200	5.75	6.20	CI	107	160	13.86	33.66	.411	41.8 3341	
27	Hupmobile 8	925H	125	206 <sup>1</sup> / <sub>2</sub>	58 <sup>1</sup> / <sub>2</sub> 60 <sup>1</sup> / <sub>2</sub> 6.50/16	4088	1145	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	32.5	303.2	120-3500	212-1200	5.80	.....	CI	113	160	13.47	34.04	.395	43.2 3296	
28	La Salle	V8, 39-50	120	202 <sup>1</sup> / <sub>2</sub>	58 59 7.00/16	3740	1320	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	36.4	322.0	125-3400	234-1800	6.25	5.75	CI	155	1000	11.61	29.92	.388	41.7 2764	
29	Lincoln	V12	136-145	(p)	60 60 7.50/17	5735	4800	12-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	46.8	414.0	150-3400	312-1200	6.38	.....	AI	105	Cra	13.85	38.23	.362	39.1 3027	
30	Lincoln-Zephyr	.....	125	210	55 <sup>1</sup> / <sub>2</sub> 58 <sup>1</sup> / <sub>2</sub> 7.00/16	3620	1360	12-2 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub>	36.3	257.0	110-3900	186-2000	6.70	.....	AI	105	Cra	13.55	32.90	.411	40.4 3130	
31	Mercury	.....	116	55 <sup>1</sup> / <sub>2</sub> 58 <sup>1</sup> / <sub>2</sub> 6.00/16	2900	930	8-3-187x3 <sup>1</sup> / <sub>2</sub>	32.5	239.0	95-3600	170-2100	6.15	.....	CI	145	2200	12.30	30.52	.397	36.9 2637		
32	Nash Lafay.	3910	117	200 <sup>1</sup> / <sub>2</sub>	60 <sup>1</sup> / <sub>2</sub> 60 <sup>1</sup> / <sub>2</sub> 6.00/16	3290	840	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	27.3	234.8	99-3400	179-1200	6.30	.....	CI	110	Cra	14.01	33.23	.421	37.6 3055	
33	Nash Amb. 6	3920	121	204 <sup>1</sup> / <sub>2</sub>	58 <sup>1</sup> / <sub>2</sub> 60 <sup>1</sup> / <sub>2</sub> 6.25/16	3450	985	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	27.3	234.8	105-3400	190-1050	6.00	.....	CI	125	350	14.69	32.85	.447	35.6 3018	
34	Nash Amb. 8	3980	125	208 <sup>1</sup> / <sub>2</sub>	58 <sup>1</sup> / <sub>2</sub> 61 <sup>1</sup> / <sub>2</sub> 7.00/16	3800	1235	8-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	31.2	260.8	115-3400	200-1200	6.00	.....	CI	110	350	14.57	33.04	.440	34.8 2890	
35	Oldsmobile	.....	60	115	189 <sup>1</sup> / <sub>2</sub>	58 59 6.00/16	3000	889	6-3 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub>	28.4	216.0	90-3200	170-1600	6.20	5.67	CI	151	1000	13.88	33.33	.416	39.3 3204
36	Oldsmobile	.....	70	120	197 <sup>1</sup> / <sub>2</sub>	58 59 6.00/16	3180	952	6-3 <sup>1</sup> / <sub>2</sub> x4 <sup>1</sup> / <sub>2</sub>	28.4	222.7	95-3300	180-1600	6.10	5.61	CI	146	1000	13.84	33.47	.413	39.1 3222
37	Oldsmobile	.....	80	120	197 <sup>1</sup> / <sub>2</sub>	58 59 6.50/16	3340	1043	6-3 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub>	33.8	257.1	110-3500	200-1800	6.20	5.80	CI	152	1000	12.99	30.36	.427	41.6 3296
3																						

# PASSENGER CARS

Arrangement Valve Seat Insert (Exhaust)	VALVES				PISTONS			RINGS		Crankshaft Drive— Make and Type	Crankshaft Counterbalanced	Vibration Damper	No. of Main Bearings	Crankpin Diameter (In.)	Crankpin Length (In.)	CARBURETOR	REAR AXLE													
	Spring Pressure (Lb.)	Intake	Exhaust	Head Diam. Seat Angle	Head Diam. Seat Angle	Material	Weight (Oz.) Without Rings, Pin or Bushing	Pin Diameter	Pin Locked In								Spark Plug— Make and Model	Electrical System—Make	Battery—Make	Type	Final Drive	Torque Medium	Gear Ratio							
		Open	Closed																											
L NO 44	28	1.03	45	1.03	45	Ais	4.75	.608	R	2- $\frac{3}{8}$	1- $\frac{1}{8}$	Own...	Ge Y	N	2	1.31	1.25	TII...1 $\frac{1}{2}$	M10BX	SL	AL...	A-9	AL	USL	1 $\frac{1}{2}$	SB	Sp	5.25	Tr	1
I NO 70	29	1.53	45	1.34	45	Ais	14.25	.812	R	2-(c)	2- $\frac{1}{8}$	LB...	Ch Y	Y	5	2.00	1.21	Car...	1419S	SC	AC...	46	DR	Del	1 $\frac{1}{2}$	Hyp	TT	4.44	IC	2
I NO 70	29	1.78	45	1.43	45	Ais	17.30	.875	R	2-(c)	2- $\frac{1}{8}$	LB...	Ch Y	Y	5	2.25	1.30	Str...	1 $\frac{1}{2}$ AAV-26	SC	AC...	46	DR	Del	1 $\frac{1}{2}$	Hyp	TT	3.90	IC	3
I NO 70	29	1.78	45	1.43	45	Ais	17.30	.875	R	2-(c)	2- $\frac{1}{8}$	LB...	Ch Y	Y	5	2.25	1.30	Str...	1 $\frac{1}{2}$ AAV-26	SC	AC...	46	DR	Del	1 $\frac{1}{2}$	Hyp	TT	4.18	IC	4
I NO 70	29	1.78	45	1.43	45	Ais	17.30	.875	R	2-(c)	2- $\frac{1}{8}$	LB...	Ch Y	Y	5	2.25	1.30	Str...	1 $\frac{1}{2}$ AAV-26	SC	AC...	46	DR	Del	1 $\frac{1}{2}$	Hyp	TT	4.55	IC	5
L NO 145	66	1.88	45	1.63	45	Ais	18.30	.875	F	2-(c)	2- $\frac{1}{8}$	Mor...	Ch Y	Y	3	2.46	2.03	Str...	1 $\frac{1}{2}$ AAZ-26	SC	AC...	104	DR	Del	1 $\frac{1}{2}$	Hyp	Sp	3.92	IC	6
L NO 145	66	1.88	45	1.63	45	Ais	18.30	.875	F	2-(c)	2- $\frac{1}{8}$	Mor...	Ch Y	Y	3	2.46	2.03	Str...	1 $\frac{1}{2}$ AAZ-26	SC	AC...	104	DR	Del	1 $\frac{1}{2}$	Hyp	Sp	3.92	IC	7
L NO 145	66	1.88	45	1.63	45	Ais	18.30	.875	F	2-(c)	2- $\frac{1}{8}$	Mor...	Ch Y	Y	3	2.46	2.03	Str...	1 $\frac{1}{2}$ AAZ-26	SC	AC...	104	DR	Del	1 $\frac{1}{2}$	Hyp	Sp	4.58	IC	8
L NO 88*	50	1.50	45	1.38	45	Ais	15.28	.812	R	2-(c)	1- $\frac{1}{8}$	Mor...	Ch Y	Y	8	2.00	1.75	Car...	1 $\frac{1}{2}$ (d)	SC	AC...	104	DR	Del	1 $\frac{1}{2}$	Hyp	Sp	4.31	IC	9
I NO 127	52 $\frac{1}{2}$	1.64	30	1.46	30	CT	22.72	.865	R	2-124	1- $\frac{1}{8}$	Var...	Ge Y	Y	4	2.31	1.50	Car...	1 $\frac{1}{2}$ 420S	SL(n)	AC...	46	DR	Del	1 $\frac{1}{2}$	Hyp	TT	3.73	C	10
I NO 127	52 $\frac{1}{2}$	1.64	30	1.46	30	CT	22.72	.865	R	2-124	1- $\frac{1}{8}$	Var...	Ge Y	Y	4	2.31	1.50	Car...	1 $\frac{1}{2}$ 420S	SL(n)	AC...	46	DR	Del	1 $\frac{1}{2}$	Hyp	TT	4.22	IC	11
L Y 105	42 $\frac{1}{2}$	1.65	45	1.53	45	Ais	...	.859	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Mor...	Ch Y	Y	4	2.12	1.21	Car...	1 $\frac{1}{2}$ E6N1	SC	AL...	A7	AL	Wil	1 $\frac{1}{2}$	Hyp	Sp	4.10	IC	12
L Y 126	55	1.53	45	1.34	45	Ais	...	.859	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	MW...	Ch Y	Y	5	2.18	1.12	Str...	1 $\frac{1}{2}$ AAV-2	SC	AL...	A7	AL	Wil	1 $\frac{1}{2}$	Hyp	Sp	3.91	IC	13
L Y 133	55	1.53	45	1.34	45	Ais	...	.859	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	MW...	Ch Y	Y	5	2.18	1.12	Str...	1 $\frac{1}{2}$ AAV-2	SC	AL...	AL6	AL	Wil	1 $\frac{1}{2}$	Hyp	Sp	4.90	IC	14
L Y 105	42 $\frac{1}{2}$	1.65	45	1.53	45	Ais	...	.859	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Mor...	Ch Y	Y	4	2.12	1.21	Car...	1 $\frac{1}{2}$ E6N1	SC	AL...	A7	AL	Wil	1 $\frac{1}{2}$	Hyp	Sp	4.10	IC	15
L Y 80	36	1.48	45	1.46	45	Ais	...	.859	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Mor...	Ch Y	Y	4	2.06	1.00	Str...	1 $\frac{1}{2}$ BXV3	SC	AL...	A7	AL	Wil	1 $\frac{1}{2}$	Hyp	Sp	4.10	IC	16
L Y 50	28	1.28	45	1.28	45	CS	8.11	.687	F	2-0922	1-1537	Cel...	Ge Y	N	3	1.80	1.54	Str...	1EE1	SL	CH...	H10	Own	Own	1 $\frac{1}{2}$	SB	TT	4.44	Tr	17
L Y 78	38 $\frac{1}{2}$	1.53	45	1.53	45	CS	11.82	.750	F	2-0917	1-1537	Cel...	Ge Y	N	3	2.00	1.75	Str...	1EE1	SL	CH...	H10	Own	Own	1 $\frac{1}{2}$	SB	TT	3.78	Tr	18
L N 93	44	1.51	30	1.32	45	Ais	14.12	.812	R	2- $\frac{1}{8}$	2- $\frac{1}{8}$	LB...	Ch Y	Y	4	2.06	1.31	Mar...	1 $\frac{1}{2}$ C-2	SL	CH...	H10	DR	Wil	1 $\frac{1}{2}$	Hyp	Sp	4.27	C	19
L N 23	44	1.51	30	1.32	45	Ais	14.12	.812	R	2- $\frac{1}{8}$	2- $\frac{1}{8}$	LB...	Ch Y	Y	4	2.06	1.31	Mar...	1 $\frac{1}{2}$ C-3	SL	CH...	H10	DR	Wil	1 $\frac{1}{2}$	Hyp	Sp	4.27	C	20
L N 80	40	1.37	45	1.37	45	Ais	10.50	.750	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	GD...	Ge Y	Y	3	1.93	1.23	Str...	1 $\frac{1}{2}$ 438S	SC	CH...	J8-A	AL	Nat	1 $\frac{1}{2}$	SB	Sp	4.11	IC	21
L N 80	40	1.37	45	1.37	45	Ais	10.50	.750	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	GD...	Ge Y	Y	3	1.93	1.27	Car...	1 $\frac{1}{2}$ 438S	SC(m)	CH...	J8-A	AL	Nat	1 $\frac{1}{2}$	SB	Sp	4.11	IC	22
L N 80	40	1.37	45	1.37	45	Ais	10.50	.750	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	GD...	Ge Y	Y	3	1.93	1.27	Car...	1 $\frac{1}{2}$ 438S	SC(m)	CH...	J8-A	AL	Nat	1 $\frac{1}{2}$	SB	Sp	4.11	IC	23
L N 80	40	1.50	45	1.37	45	Ais	10.50	.750	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	GD...	Ge Y	Y	5	2.13	1.37	Car...	1 $\frac{1}{2}$ 438S	SC(m)	CH...	J8-A	AL	Nat	1 $\frac{1}{2}$	SB	Sp	4.11	IC	24
L N 100	40	1.65	45	1.53	45	Ais	21.70	.875	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Mor...	Ch Y	Y	4	2.12	1.25	Car...	1 $\frac{1}{2}$ 438S	SC(m)	CH...	J8-A	AL	Nat	1 $\frac{1}{2}$	SB	Sp	4.11	IC	25
L N 100	40	1.65	45	1.53	45	Ais	21.70	.875	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Mor...	Ch Y	Y	4	2.12	1.25	Car...	1 $\frac{1}{2}$ 438S	SC(m)	CH...	J8-A	AL	Wil	1 $\frac{1}{2}$	SB	Sp	4.54	C	26
L N 100	40	1.53	45	1.40	45	Ais	18.40	.875	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Mor...	Ch Y	Y	5	2.25	1.25	Car...	1 $\frac{1}{2}$ 438S	SC(m)	CH...	J8-A	AL	Wil	1 $\frac{1}{2}$	SB	Sp	4.54	C	27
L N 145	66	1.88	45	1.63	45	Ais	16.88	.875	F	2-(c)	2- $\frac{1}{8}$	Mor...	Ch Y	N	3	2.46	2.03	Car...	1 $\frac{1}{2}$ 423S	SC	AC...	104	DR	Del	1 $\frac{1}{2}$	Hyp	Sp	3.92	IC	28
L Y 135	57	1.68	45	1.68	45	AI	12.50	.875	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Mor...	Ch Y	Y	4	2.50	2.00	Str...	1 $\frac{1}{2}$ EE22	SL	CH...	7	AL	Exi	FF	SB	TT	4.58	C	29
L Y 116	54	1.53	45	1.53	45	CS	11.50	.750	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Cel...	Ge Y	Y	4	2.12	1.57	Str...	1 $\frac{1}{2}$ EE1	SL	CH...	H10	Own	Own	1 $\frac{1}{2}$	SB	TT	4.44	Tr	31
L Y 78	38 $\frac{1}{2}$	1.53	45	1.53	45	CS	12.70	.750	F	2-0917	1-1537	Cel...	Ge Y	N	3	2.14	1.75	Str...	1 $\frac{1}{2}$ EE1	SL	CH...	H10	Own	Own	1 $\frac{1}{2}$	SB	TT	3.54	Tr	31
L N 114	70	1.65	45	1.53	45	Alt	19.25	.875	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Whi...	Ch Y	Y	7	2.00	1.42	Str...	1 $\frac{1}{2}$ EE1	SL(r)	AL...	B7A	AL	USL	1 $\frac{1}{2}$	Hyp	Sp	4.10	C	32
L N 114	70	1.75	45	1.59	45	Alt	19.25	.875	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Whi...	Ch Y	Y	7	2.00	1.42	Car...	1 $\frac{1}{2}$ 435S	SL(r)	AC...	45	AL	USL	1 $\frac{1}{2}$	Hyp	Sp	4.10	C	33
L N 114	70	1.85	45	1.46	45	Alt	16.20	.875	F	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Whi...	Ch N	Y	9	2.00	1.23	Str...	1 $\frac{1}{2}$ 436S	SL(r)	AC...	45	AL	USL	1 $\frac{1}{2}$	Hyp	Sp	4.10	C	34
L N 95 $\frac{1}{2}$	50 $\frac{1}{2}$	1.56	30	1.42	45	Ais	17.75	.859	P	2- $\frac{1}{8}$	2- $\frac{1}{8}$	Whi...	Ch Y	Y	4	2.12	1.37	Car...	1 $\frac{1}{2}$ 426S	SC(s)	AC...	45	DR	Del	1 $\frac{1}{2}$	Hyp	SA	4.30	IC	35
L N 95<																														

## AMERICAN

Line Number	Bus Make and Model	GENERAL										ENGINE														
		Passenger Rating	Type (City Service, Parlor, etc.)	Standard Wheelbase (In.)	Overall Length (In.)	Tread—Front and Rear (In.)		Complete Vehicle Weight (Lb.)		Standard Tire Sizes (In.)		Maximum Permissible Load on Tires (Lb.)	Front	Rear	Make and Model	Location	Number of Cylinders Bore and Stroke (In.)	Displacement (Cu. In.)	Rated Horsepower (A.M.A.)	Maximum Brake H.P. at Specified R.P.M.	Maximum Net Torque (Lb. Ft.) at R.P.M.	Valve Arrangement	Oiling System	Fuel System		
						Front	Rear	Front	Rear	Front	Rear		Front	Rear									Carburetor Make and Type	Carburetor Size (In.)	Gasoline Tank Capacity (Gal.)	
1	A. C. F.	H-9S	42	CS	245 <sup>1/2</sup>	395 <sup>1/2</sup>	80 <sup>1/2</sup> -72	17500	9.75/22	9.75/22d	8400	16800	HS	180	UF	6-5x6	707	60.0	180-2200	472-1000	I	acde	Zen. Up	2	115	
2	A. C. F.	H-9P	36	Par	245 <sup>1/2</sup>	395 <sup>1/2</sup>	80 <sup>1/2</sup> -72	19200	9.75/22	9.75/22d	8400	16800	HS	180	UF	6-5x6	707	60.0	183-2200	496-1000	I	acde	Zen. Up	2	135	
3	A. C. F.	37P	37	Par	254 <sup>1/2</sup>	396	80 <sup>1/2</sup> -72	19720	10.50/22	10.50/22d	10000	20000	HS	189	UF	6-5x6	707	60.0	183-2200	496-1000	I	acde	Zen. Up	2	125	
4	A. C. F.	H-13	30	CS	158	323 <sup>1/2</sup>	81 <sup>1/2</sup> -70 <sup>1/2</sup>	13500	9.75/20	9.00/20	7800	13000	HS	130	UF	6-4 <sup>1/2</sup> x5	425	43.3	124-2800	290-1000	I	acde	Zen. Up	1 <sup>1/2</sup>	72	
5	A. C. F.	H-15S	32	CS	188	324	81 <sup>1/2</sup> -70 <sup>1/2</sup>	13800	9.00/20	9.00/20	6500	13000	HS	135	UF	6-4 <sup>1/2</sup> x5	477	48.6	139-2800	324-1000	I	acde	Zen. Up	1 <sup>1/2</sup>	72	
6	A. C. F.	H-15P	28	Par	188	328 <sup>1/2</sup>	81 <sup>1/2</sup> -70 <sup>1/2</sup>	16100	9.75/20	9.75/20d	7800	15600	HS	135	UF	6-4 <sup>1/2</sup> x5	477	48.6	139-2800	324-1000	I	acde	Zen. Up	1 <sup>1/2</sup>	85	
7	A. C. F.	H-16	41	CS	210 <sup>1/2</sup>	394 <sup>1/2</sup>	81 <sup>1/2</sup> -72	17100	10.50/20	9.75/20d	9400	15600	HS	180	UF	6-5x6	707	60.0	180-2200	472-1000	I	acde	Zen. Up	2	90	
8	A. C. F.	26S	28	CS	158 <sup>1/2</sup>	289 <sup>1/2</sup>	82 <sup>1/2</sup> -72	10920	9.00/18	7.50/20d	6000	8800	HS	95	UF	6-4x5	377	38.4	106-2600	268-1000	I	acde	Zen. Up	1 <sup>1/2</sup>	60	
9	A. C. F.	26U	26	CS	195	295 <sup>1/2</sup>	82 <sup>1/2</sup> -72	11250	9.00/18	9.00/18d	6000	12000	HS	95	UF	6-4 <sup>1/2</sup> x5	477	48.6	139-2800	324-1000	I	acde	Zen. Up	1 <sup>1/2</sup>	60	
10	A. C. F.	36S	36	CS	188	364	81 <sup>1/2</sup> -70 <sup>1/2</sup>	14200	8.75/20	9.75/20d	7800	15800	HS	135	UF	6-4 <sup>1/2</sup> x5	477	48.6	139-2800	324-1000	I	acde	Zen. Up	1 <sup>1/2</sup>	72	
11	A. C. F.	31S	31	CS	172 <sup>1/2</sup>	328 <sup>1/2</sup>	81 <sup>1/2</sup> -69 <sup>1/2</sup>	12500	9.00/18	9.00/18d	6000	12000	HS	130	UF	6-4 <sup>1/2</sup> x5	425	43.3	124-2800	290-1000	I	acde	Zen. Up	1 <sup>1/2</sup>	72	
12	Fageol	1350	18-21	Chs	189 <sup>1/2</sup>	341	70 <sup>1/2</sup> -75	11750	8.25/20	.....	(1)	(1)	Wau.	6BK	RC	6-3 <sup>1/2</sup> x4 <sup>1/2</sup>	282	33.8	82-2800	190-1000	L	acdf	Zen. Do	1 <sup>1/2</sup>	50	
13	Fageol	2500	21-29	Chs	189 <sup>1/2</sup>	341	70 <sup>1/2</sup> -75	12500	8.25/20	8.25/20d	(2)	(2)	Wau.	6MK	RC	6-4 <sup>1/2</sup> x3 <sup>1/2</sup>	381	40.8	85-2500	240-900	L	acdf	Zen. Do	1 <sup>1/2</sup>	50	
14	Fageol	3000	29-36	Chs	189 <sup>1/2</sup>	341	78-75	15500	9.75/20	9.75/20d	(3)	(3)	HS	135	Ms	6-4 <sup>1/2</sup> x5	477	48.6	130-2200	300-1200	I	acdf	Zen. Do	1 <sup>1/2</sup>	50	
15	Flexible	16-C-78	16-20	Par	206 <sup>1/2</sup>	305	58 <sup>1/2</sup> -73 <sup>1/2</sup>	7330	7.00/20	7.00/20d	.....	.....	Che.	1939	FH	6-3 <sup>1/2</sup> x3 <sup>1/2</sup>	216	29.4	76-3200	170-(6)	I	adf	Car. Do	1 <sup>1/2</sup>	38	
16	Flexible	19-C-78	19-24	Par	206 <sup>1/2</sup>	341	58 <sup>1/2</sup> -73 <sup>1/2</sup>	7980	7.00/20	7.00/20d	.....	.....	Che.	1939	FH	6-3 <sup>1/2</sup> x3 <sup>1/2</sup>	216	29.4	76-3200	170-(6)	I	adf	Car. Do	1 <sup>1/2</sup>	38	
17	Flexible	20-CL-78	20-25	Par	182 <sup>1/2</sup>	334 <sup>1/2</sup>	69 <sup>1/2</sup> -73 <sup>1/2</sup>	8980	7.50/20	7.50/20d	.....	.....	Che.	1939	FE	6-3 <sup>1/2</sup> x3 <sup>1/2</sup>	216	29.4	76-3200	170-(6)	I	adf	Car. Do	1 <sup>1/2</sup>	40	
18	Flexible	25-CL-78	25-30	Par	182	351 <sup>1/2</sup>	76-70 <sup>1/2</sup>	.....	7.50/20	7.50/20d	.....	.....	Che.	1939	R	6-3 <sup>1/2</sup> x3 <sup>1/2</sup>	216	29.4	76-3200	170-(6)	I	adf	Car. Do	1 <sup>1/2</sup>	40	
19	Ford	91B97	25	CS	141	296 <sup>1/2</sup>	74 <sup>1/2</sup> -85	4630	9.00/18	7.00/20d	.....	.....	Ford	F	8-3 <sup>1/2</sup> x3 <sup>1/2</sup>	221	30.0	85-3800	150-2000	L	acdg	Do	.97	45		
20	Ford	99B97	25	CS	141	296 <sup>1/2</sup>	74 <sup>1/2</sup> -85	4630	9.00/18	7.00/20d	.....	.....	Ford	FH	8-3 <sup>1/2</sup> x3 <sup>1/2</sup>	239	32.5	95-3600	170-2100	L	acdg	Do	.....	.....		
21	Gar Wood	EFT	29	CS	201 <sup>1/2</sup>	336 <sup>1/2</sup>	75-85	.....	.....	7.00/20	7.00/20d	.....	.....	Ford	99-B	R	8-3 <sup>1/2</sup> x3 <sup>1/2</sup>	239	32.5	95-3600	170-2100	L	acdg	CG. Do	.....	50
22	Gar Wood	EFI	25	Par	201 <sup>1/2</sup>	336 <sup>1/2</sup>	75-85	.....	7.00/20	7.00/20d	.....	.....	Ford	99-B	R	8-3 <sup>1/2</sup> x3 <sup>1/2</sup>	239	32.5	95-3600	170-2100	L	acdg	CG. Do	.....	50	
23	Mack	CW	23-25	CS	165	292	80 <sup>1/2</sup> -73 <sup>1/2</sup>	.....	7.50/20	7.50/20d	.....	.....	Own.	CU	RT	6-3 <sup>1/2</sup> x5	354	36.0	100-2600	237-1000	L	abcdg	Str. Up	1 <sup>1/2</sup>	55	
24	Mack	CY	25-27	CS	162	309	80 <sup>1/2</sup> -73 <sup>1/2</sup>	.....	7.50/20	7.50/20d	.....	.....	Own.	CU	RT	6-3 <sup>1/2</sup> x5	354	36.0	100-2600	237-1000	L	abcdg	Str. Up	1 <sup>1/2</sup>	55	
25	Mack	CQ	31	CS	178	353 <sup>1/2</sup>	82-73	.....	9.00/22	9.00/22d	.....	.....	Own.	CT	RT	6-4 <sup>1/2</sup> x5 <sup>1/2</sup>	352	48.6	129-2300	108-800	L	abcdg	Str. Up	1 <sup>1/2</sup>	80	
26	Mack	CT	33-37	CS	214	389 <sup>1/2</sup>	82-73	.....	9.00/22	9.00/22d	.....	.....	Own.	CT	RT	6-4 <sup>1/2</sup> x5 <sup>1/2</sup>	352	48.6	129-2300	108-800	L	abcdg	Str. Up	1 <sup>1/2</sup>	80	
27	Mack	31S	161	265 <sup>1/2</sup>	68-65	82-73	.....	7.00/20	7.00/20d	.....	.....	Own.	FO	253	29.4	75-2800	160-1920	L	abcdg	Str. Up	1 <sup>1/2</sup>	30				
28	Mack	37S	161	230 <sup>1/2</sup>	60 <sup>1/2</sup>	66 <sup>1/2</sup> -65	.....	7.50/20	7.50/20d	.....	.....	Own.	FM	271	31.6	78-2800	178-1000	L	abcdg	Str. Up	1 <sup>1/2</sup>	30				
29	Mack	43SB	212	CS	229	329 <sup>1/2</sup>	77-69 <sup>1/2</sup>	.....	8.25/20	8.25/20d	.....	.....	Own.	FK	290	33.7	85-2800	192-1000	L	abcdg	Str. Up	1 <sup>1/2</sup>	40			
30	Mack	43SBX	212	CS	229	329 <sup>1/2</sup>	77-69 <sup>1/2</sup>	.....	8.25/20	8.25/20d	.....	.....	Own.	BG	310	31.6	90-3000	202-1000	L	abcdg	Str. Up	1 <sup>1/2</sup>	40			
31	Mack	49SB	231	CS	231	356 <sup>1/2</sup>	78 <sup>1/2</sup> -69 <sup>1/2</sup>	.....	8.25/20	8.25/20d	.....	.....	Own.	CU	354	36.0	92-2300	237-1000	L	abcdg	Str. Up	1 <sup>1/2</sup>	40			
32	Mack	55SB	250	CS	250	383 <sup>1/2</sup>	77 <sup>1/2</sup> -69 <sup>1/2</sup>	.....	9.00/20	9.00/20d	.....	.....	Own.	CU	354	36.0	92-2300	237-1000	L	abcdg	Str. Up	1 <sup>1/2</sup>	40			
33	Reo	38S	25-29	Par	213	325	81 <sup>1/2</sup> -72 <sup>1/2</sup>	11170	8.25/18	8.25/18d	2450	2450	Her.	JXDTR	R	6-4 <sup>1/2</sup> x4 <sup>1/2</sup>	361	40.8	106-3000	254-900	L	acd	Zen. Do	1 <sup>1/2</sup>	75	
34	Reo	30S	37	CS	177	289	81 <sup>1/2</sup> -72 <sup>1/2</sup>	9270	7.50/18	7.50/18d	2450	2450	Her.	JXCT	R	6-3 <sup>1/2</sup> x5 <sup>1/2</sup>	310	31.5	97-2800	226-1000	L	abcd	Zen. Do	1 <sup>1/2</sup>	43	
35	Reo	384	26	CS	150	291	81 <sup>1/2</sup> -72 <sup>1/2</sup>	9460	7.50/18	7.50/18d	2450	2450	Her.	WXC-3	R	6-3 <sup>1/2</sup> x5 <sup>1/2</sup>	310	31.5	97-2800	226-1000	L	abcd	Zen. Do	1 <sup>1/2</sup>	43	
36	Reo	385	30	CS	186	327	81 <sup>1/2</sup> -72 <sup>1/2</sup>	10390	8.25/18	8.25/18d	2450	2450	Her.	WXC-3	R	6-4 <sup>1/2</sup> x4 <sup>1/2</sup>	361	40.8	106-3000	254-900	L	acd	Zen. Do	1 <sup>1/2</sup>	43	
37	Reo	2LM7	23	CS	166	303 <sup>1/2</sup>	78 <sup>1/2</sup> -69 <sup>1/2</sup>	.....	7.00/20	7.00/20d	.....	.....	Own.	S3 F	268	26.8	83-2800	178-1200	L	acd	Car. Do	1 <sup>1/2</sup>	38			
38	Reo	2LM7F	23	CS	190	293 <sup>1/2</sup>	78 <sup>1/2</sup> -69 <sup>1/2</sup>																			

# BUS CHASSIS

ELECTRICAL SYSTEM		GOVERNOR		TRANSMISSION			REAR AXLE		BRAKES			SPRINGS		RUNNING GEAR			Line Number													
Ignition System (Make)	Generator and Starter (Make)	Battery		Type	Maximum Governed Speed (M.P.H.)	Integral with Engine	Clutch—Make and Type		Make and Model	Ratio	Service		Hand		Front		Rear		Front Axle—Make	Steering Gear—Make	Outside Diam. of Min. Turning Circle (Ft.)	Wheels—Make								
		Make	Model				Make	Model			Standard	Optional	Type and Location	Operation	Lining Area (Sq. In.)	Type and Location	Lining Area (Sq. In.)	No. of Leaves	Length and Width (In.)	No. of Leaves	Length and Width (In.)									
DR	DR	Op	12-158	Ce	52	N	Lg. SP	Spi	4	4.36	2-Spi	Tim.	59023	5.12	5.62	I-Fw	A	795	Ex-Ts	121	14	54-31 $\frac{1}{2}$	12	64-5	Tim	R	82	Bd	1	
DR	DR	Op	12-158	Ce	66	N	Lg. SP	Spi	4	4.36	2-Spi	Tim.	59023	4.66	4.91	I-Fw	A	795	Ex-Ts	121	14	54-31 $\frac{1}{2}$	13	64-5	Tim	R	82	Bd	2	
DR	DR	Op	12-158	Ce	53	N	Spi.	SP	3	4.04	2-Spi	Tim.	59023	4.56	3.53	I-Fw	A	824	Ex-Ts	121	14	58-4	13	64-5	Tim	R	79	Bd	3	
DR	DR	Op	12-158	Ce	55	N	Spi.	SP	3	4.04	2-Spi	Tim.	58258WX1	5.12	4.56	I-Fw	A	623	Ex-Ts	88	13	56-3 $\frac{1}{2}$	16	60-3 $\frac{1}{2}$	Tim	R	55	Dn	4	
DR	DR	Op	12-158	Ce	66	N	Spi.	SP	4	4.76	2-Spi	Tim.	58258WX2	5.12	4.56	I-Fw	A	623	Ex-Ts	88	14	56-3 $\frac{1}{2}$	15	60-4	Tim	R	60	Bd	5	
DR	DR	Op	12-158	Ce	45	N	Lg. DP	Spi	3	3.80	2-Spi	Tim.	59023	5.62	5.12	I-Fw	A	824	Ex-Ts	121	13	61-4	11	64-5	Tim	R	72	Dn	6	
DR	DR	Op	12-138	Ce	50	N	Spi.	SP	3	4.01	2-Spi	Tim.	54418WX1	5.43	—	I-Fw	A	460	Ex-Ts	95	12	56-3	14	58 $\frac{1}{2}$ -3	Tim	R	52	Bd	7	
DR	DR	Op	12-138	Ce	51	N	Spi.	SP	3	4.01	2-Spi	Tim.	54418WX2	5.43	—	I-Fw	A	460	Ex-Ts	95	12	54-3	16	58 $\frac{1}{2}$ -3	Tim	R	65	Dn	8	
DR	DR	Op	12-158	Ce	53	N	Spi.	SP	3	3.80	2-Spi	Tim.	58282	5.57	—	I-Fw	A	692	Ex-Ts	88	11	59-3 $\frac{1}{2}$	13	60-4	Tim	R	65	Dn	9	
DR	DR	Opt	12-158	Ce	52	Y	Spi.	SP	3	3.80	2-Spi	Tim.	56515	5.28	4.44	I-Fw	A	575	Ex-Ts	88	13	56-3	16	60-3 $\frac{1}{2}$	Tim	R	60	Bd	10	
DR	DR	Exi	6-127	Ce	52	Y	Lg. SP	WG	4	6.40	2-Spi	Tim.	54200-H	5.83	—	I-Fw	H	306	Ex	61	9	43-3 $\frac{1}{2}$	13	60-3 $\frac{1}{2}$	Tim	R	36 $\frac{1}{2}$	Bd	12	
DR	DR	Exi	6-127	Ce	44	Y	Spi.	SP	3	4.03	2-Spi	Tim.	56200-H	6.17	—	I-Fw	A	355	Ex	45	13	60-3 $\frac{1}{2}$	16	60-3 $\frac{1}{2}$	Tim	R	36 $\frac{1}{2}$	Bd	13	
DR	DR	Exi	6-127	Ce	43	Y	Spi.	SP	4	6.63	2-Spi	Tim.	58200TW	7.80	—	I-Fw	A	504	Ex-Ts	45	8	60-3 $\frac{1}{2}$	12	60-3 $\frac{1}{2}$	Tim	R	36 $\frac{1}{2}$	Bd	14	
DR	DR	Del	6-105	—	—	—	Che.	SP	Che	4	7.23	3-Che	Che.	1938	5.43	—	I-Fw	H	330	I-Rw	215	—	36-1 $\frac{1}{2}$	—	54-2 $\frac{1}{2}$	Che	Che	—	Bd	15
DR	DR	Del	6-105	—	—	—	Che.	SP	Che	4	7.23	3-Che	Che.	1938	5.43	—	I-Fw	H	330	I-Rw	215	—	36-1 $\frac{1}{2}$	—	54-2 $\frac{1}{2}$	Che	Che	—	Bd	16
DR	DR	Del	6-105	—	—	—	Che.	SP	Che	4	7.23	3-Che	Che.	1938	5.43	—	I-Fw	H	330	I-Rw	215	—	52-2 $\frac{1}{2}$	—	54-2 $\frac{1}{2}$	Tim	R	17	—	18
Fo	Fo	—	12-137	—	—	—	Lg.	SP	Fo	3	4.30	3-Spi	Ford	6.67	5.14	I-Fw	A	380	I-Rw	120	13	50-2 $\frac{1}{2}$	13	50-2 $\frac{1}{2}$	Fo	Fo	54	—	19	
Fo	Fo	—	12-137	—	—	—	Lg.	SP	Fo	3	4.30	3-Spi	Ford	6.67	5.14	I-Fw	A	380	I-Rw	120	13	50-2 $\frac{1}{2}$	13	50-2 $\frac{1}{2}$	Fo	Fo	54	—	20	
Fo	LN	Wil	12-150	Su	—	—	Lg.	SP	Spi	3	3.55	2-Spi	Tim.	53300	6.60	5.14	I-Fw	A	381	Ex-Ts	—	—	48-3	—	62-3	Tim	R	74	Bd	21
Fo	LN	Wil	12-150	Su	—	—	Lg.	SP	Spi	3	3.55	2-Spi	Tim.	53300	5.14	6.60	I-Fw	A	381	Ex-Ts	—	—	48-3	—	62-3	Tim	R	74	Bd	22
DR	DR	Exi	12-158	Su	45	N	O.	SP	Own	3	4.16	2-Cle	Own	CW	4.45	4.90	I-Fw	A	437	Ex-Ts	82	9	52-3	11	52-3	Own	O	—	O	23
DR	DR	Exi	12-158	Su	45	N	O.	SP	Own	3	4.16	2-Cle	Own	CY	4.45	4.90	I-Fw	A	437	Ex-Ts	82	9	52-3	11	52-3	Own	O	—	O	24
DR	DR	Exi	12-158	Su	49	N	O.	SP	Own	3	3.79	2-Cle	Own	CO	5.43	5.86	I-Fw	A	635	Ex-Ts	86	—	60-3 $\frac{1}{2}$	—	60-4	Own	O	—	O	25
DR	DR	Exi	12-158	Su	49	N	O.	SP	Own	3	3.79	2-Cle	Tim.	CT	5.43	5.86	I-Fw	A	635	Ex-Ts	86	—	60-3 $\frac{1}{2}$	—	60-4	Own	O	—	O	26
DR	DR	Exi	6-135	—	59	N	O.	SP	Own	4	6.34	3-Spi	Own	H	295	I-Ts	83	9	50-3	13	60-3	Own	O	—	O	27				
DR	DR	Exi	6-118	—	49	N	O.	SP	Own	4	6.34	3-Spi	Own	H	329	Ex-Ts	83	9	50-3	13	60-3	Own	O	—	O	28				
DR	DR	Exi	6-118	—	45	N	O.	SP	Own	4	6.34	4-Spi	Own	H	370	Ex-Ts	83	10	50-3	11	60-3 $\frac{1}{2}$	Own	O	—	O	29				
DR	DR	Exi	6-118	—	45	N	O.	SP	Own	5	7.53	4-Spi	Own	H	370	Ex-Ts	87	10	50-3	11	60-3 $\frac{1}{2}$	Own	O	—	O	30				
DR	DR	Exi	6-118	—	40	N	O.	SP	Own	5	7.53	4-Spi	Own	H	370	Ex-Ts	87	12	50-3	14	60-3 $\frac{1}{2}$	Own	O	—	O	31				
DR	DR	Wil	12-152	Su	53	Y	Lg.	SP	Cla	3	3.38	2-Mec	Tim.	53502-A1	4.57	4.38	I-Fw	A	470	Ex-Ts	69	10	58-3 $\frac{1}{2}$	11	58-3 $\frac{1}{2}$	Tim	R	70 $\frac{1}{2}$	MW	33
DR	DR	Wil	12-152	Su	46	Y	Lg.	SP	Cla	3	3.38	2-Mec	Tim.	53502-A1	5.66	5.14	I-Fw	A	470	Ex-Ts	89	10	58-3 $\frac{1}{2}$	11	58-3 $\frac{1}{2}$	Tim	R	57	MW	34
DR	DR	Wil	12-152	Su	46	Y	Lg.	SP	Cla	3	3.38	2-Mec	Tim.	53502-A1	5.66	5.14	I-Fw	A	470	Ex-Ts	89	10	58-3 $\frac{1}{2}$	11	58-3 $\frac{1}{2}$	Tim	R	58 $\frac{1}{2}$	MW	35
DR	DR	Wil	12-152	Su	47	Y	Lg.	SP	Cla	3	3.38	2-Mec	Tim.	53502-A1	5.14	—	I-Fw	A	470	Ex-Ts	89	10	58-3 $\frac{1}{2}$	11	58-3 $\frac{1}{2}$	Tim	R	69	MW	36
EA	EA	Wil	6-240	—	B	SP	Own	4	6.72	3-Cle	Own	2LM7	5.28	—	I-Fw	A	394	Ex-Ts	61	11	54-2 $\frac{1}{2}$	11	54-2 $\frac{1}{2}$	Own	R	51	MW	37		
EA	EA	Wil	6-240	—	B	SP	Own	4	6.72	3-Cle	Own	2LM7	5.28	—	I-Fw	A	394	Ex-Ts	61	12	54-2 $\frac{1}{2}$	12	54-2 $\frac{1}{2}$	Own	R	55	MW	38		
EA	EA	Wil	6-105	Su	43	Y	B.	SP	WG	4	6.40	3-Cle	Cla.	R-751	5.57	5.12	I-Fw	H	271	Ex-Ts	49	9	36-2	14	55-3	Cla	R	77 $\frac{1}{2}$	Bd	39
DR	DR	Wil	6-136	Su	62	Y	B.	SP	WG	4	6.40	3-Cle	Tim.	54414	6.80	4.85	I-Fw	H	320	Ex-Ts	49	9	39-2 $\frac{1}{2}$	15	55-3	Tim	R	55	Bd	40
DR	DR	Wil	6-136	Su	47	Y	WL	SP	Cla	5	7.58	3-Cle	Tim.	56411	6.83	6.16	I-Fw	A	418	I-Rw	274	10	39-2 $\frac{1}{2}$	15	55-3	Tim	R	55	Bd	41
DR	DR	Exi	12-117	Su	—	—	Spi.	SP	Spi	3	4.04	2-Spi	Tim.	53537-A1	5.67	4.57	I-Fw	A	384	Ex-Ts	31	11	—	14	60-3	Tim	R	61 $\frac{1}{2}$	Bd	42
DR	DR	Exi	12-117	Su	—	—	Spi.	SP	Spi	3	4.04	2-Spi	Tim.	53537-A1	5.67	5.14	I-Fw	A	384	Ex-Ts	31	11	—	14	60-3	Tim	R	61 $\frac{1}{2}$	Bd	43
DR	DR	Exi	12-117	Su	—	—	Spi.	SP	Spi	3	4.04	2-Spi	Tim.	54419-A1	5.83	4.86	I-Fw	A	384	Ex-Ts	31	13	45-3	14	60-3	Tim	R	70 $\frac{1}{2}$	Bd	44
DR	DR	Exi																												

# Passenger Car Chassis and Engine Trends

## (Based on Units Sold)

	No. of Units Sold*	Gross Shipping Wgt. of Cars Sold (lb.)†	Gross Max. Hp. of Cars Sold‡	Average Weight (lb.)	Average Hp.
1930	2,625,979	7,320,000,000	142,800,000	2,780	54
1931	1,908,141	5,380,000,000	109,200,000	2,820	57
1932	1,096,399	3,200,000,000	75,400,000	2,920	69
1933	1,493,794	4,220,000,000	106,000,000	2,820	71
1934	1,888,557	5,560,000,000	156,000,000	2,940	83
1935	2,743,908	8,120,000,000	234,000,000	2,960	85
1936	3,404,497	10,190,000,000	291,000,000	3,000	86
1937	3,483,752	10,470,000,000	303,900,000	3,005	87
1938	1,891,021	6,428,000,000	195,057,000	3,452	103

† Shipping weight of 5-passenger, 4-door sedan, taken as typical.

‡ Maximum horsepower taken from previous Statistical Issues.

\* R. L. Polk & Co., registrations of new passenger cars.

## (Based on Number of Models Offered)

Hp. per cu. in. of Displacement	Average Compression Ratio		Average B.M.E.P. At Maximum Hp. (Lb. per Sq. In.)		Bore, Stroke, Displacement		
	1927	1928	1927	1928	Bore (Inches)	Stroke (Inches)	Piston Displ. (Cu. In.)
1927	.256	.276	1927	4.55	1927	3.26	254.9
1928	.276	.276	1928	4.86	1928	3.27	257.7
1929	.306	.306	1929	4.99	1929	3.27	261.3
1930	.331	.331	1930	5.15	1930	3.26	264.6
1931	.344	.344	1931	5.23	1931	3.21	273.0
1932	.353	.353	1932	5.29	1932	3.26	283.9
1933	.376	.376	1933	5.57	1933	3.23	284.1
1934	.388	.388	1934	5.72	1934	3.24	289.2
1935	.398	.398	1935	5.98	1935	3.23	271.4
1936	.411	.411	1936	6.14	1936	3.39	267.9
1937	.417	.417	1937	6.25	1937	3.25	277.6
1938	.412	.412	1938	6.32	1938	3.25	271.1
1939	.415	.415	1939	6.32	1939	3.24	255.3

Average Piston Speeds (Feet per Min.)	Displacement per Cylinder (Cu. In.)		Average Number of Cylinders		Average R.P.M.		Average Brake Horsepower	
	1927	1928	1927	1928	1927	1928	1927	1928
1927	2150	2150	39.5	6.45	1927	2740	1927	65.8
1928	2210	2210	39.1	6.59	1928	2860	1928	70.9
1929	2310	2310	38.9	6.71	1929	3063	1929	81.6
1930	2380	2380	37.6	7.04	1930	3170	1930	87.6
1931	2395	1931	36.8	7.49	1931	3230	1931	95.0
1932	2390	1932	36.7	7.78	1932	3250	1932	101.0
1933	2463	1933	36.0	7.88	1933	3360	1933	106.5
1934	2508	1934	36.2	7.97	1934	3420	1934	112.5
1935	2535	1935	36.1	7.51	1935	3480	1935	109.6
1936	2498	1936	35.6	7.50	1936	3487	1936	110.1
1937	2554	1937	35.8	7.74	1937	3556	1937	115.9
1938	2545	1938	35.7	7.60	1938	3576	1938	111.7
1939	2498	1939	35.1	7.28	1939	3543	1939	105.9

## Ten Leading Industries During 1937 as Reported by Census of Manufactures

(Rated in order of the value of their products)

	Number of Establishments	Salaried Employees	Wage Earners	Salaries	Wages	Cost of Materials, Fuel, Electric Energy, Etc.	Value of Products	Value Added by Manufacture
Steel Works and Rolling-mill products	410	40,496	479,342	\$109,080,427	\$779,776,491	\$1,833,744,640	\$3,330,481,150	\$1,496,746,510
Motor Vehicles, not including motorcycles	131	22,474	194,527	48,673,258	316,141,350	2,394,269,305	3,096,218,569	701,949,264
Meat Packing, wholesale	1,160	25,097	127,476	52,307,756	170,386,207	2,386,090,468	2,787,357,940	401,267,472
Petroleum Refining	365	15,268	83,182	36,393,120	140,414,750	2,064,306,627	2,546,745,730	482,439,103
Motor Vehicle Bodies and Parts	936	28,349	284,813	65,541,738	439,939,723	1,275,073,117	2,080,017,798	804,944,681
Electrical Machinery, apparatus and supplies	1,435	60,047	257,680	133,708,060	355,958,610	642,866,693	1,622,088,291	979,231,598
Bread and other Bakery products	17,183	23,747	239,388	45,460,779	293,994,425	727,021,811	1,426,162,889	699,141,048
Printing and Publishing, newspaper and periodical	9,242	142,377	134,995	273,108,171	221,420,106	392,476,921	1,393,623,224	1,001,144,303
Cigarettes	34	1,506	26,149	3,703,040	24,182,395	771,521,509	968,926,917	197,405,408
Machinery, not elsewhere classified	2,298	36,427	146,629	86,498,075	217,737,078	375,647,346	964,150,996	588,503,650
Total—for ten leading industries	33,204	395,788	1,974,181	\$854,474,424	\$2,959,951,135	\$12,863,020,437	\$20,215,793,474	\$7,352,773,037
Total—for all industries (351)	166,793	1,216,993	8,569,578	\$2,716,473,756	\$10,112,808,089	\$35,536,139,648	\$60,710,072,958	\$25,173,933,310
Per Cent, first ten are of all industries	20%	33%	23%	31%	29%	36%	33%	29%



Line 2 Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZES				ENGINE DETAILS				TRANSMISSION		REAR AXLE		FRONT AXLE		BRAKES		FRAME											
		Front Standard and	Rear Standard and	Front Sizing rear	Rear Sizing rear	Front Maximum	Rear Maximum	Front Maximum	Rear Maximum	Front Maximum	Rear Maximum	Front Maximum	Rear Maximum	Front Maximum	Rear Maximum	Front Maximum	Rear Maximum	Front Maximum	Rear Maximum	Front Maximum	Rear Maximum	Front Maximum	Rear Maximum										
1	Auto-car. .... (1) A	1250	139	179	13500	4700	6	50	20D	825	20	Her JXC	6-3	5	4	4	243	5	8	184	73	2300	7	24	10	Y Cla 185F	4	Tim 64412	SE	H	** 6.8	Tim 31007	T
2	Auto-car. .... (2) B	1625	189	179	16000	5000	6	50	20D	825	20	Her JXC	6-3	5	4	4	243	5	8	197	78	2300	7	24	10	Y Cla 200VO	5	Own RRL	2F	H	** 6.8	Tim 31008	T
3	Auto-car. .... (3) C	2280	164	212	18400	6715	7	50	20D	825	20	Her JXC	6-3	5	4	4	243	5	8	197	78	2300	7	24	10	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
4	Auto-car. .... (4) D	2535	164	212	18400	6715	7	50	20D	825	20	Her JXC	6-3	5	4	4	243	5	8	197	78	2300	7	24	10	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
5	Auto-car. .... (5) E	3025	156	200	25000	7400	9	75	20D	975	20	Own 855	6-4	5	4	4	258	5	8	209	85	2300	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
6	Auto-car. .... (6) F	3620	164	212	25000	7400	9	75	20D	975	20	Own 855	6-4	5	4	4	258	5	8	209	85	2300	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
7	Auto-car. .... (7) G	4200	164	212	26000	8445	10	80	20	1020	20	Own 401	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
8	Auto-car. .... (8) H	4500	164	212	28000	8705	9	75	20D	1050	20	Own 401	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
9	Auto-car. .... (9) I	5600	156	115	26000	10380	10	50	20D	975	20	Own 401	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
10	Auto-car. .... (10) J	5100	164	212	23000	10300	10	50	20D	975	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
11	Auto-car. .... (11) K	6000	156	124	30000	13000	10	50	20D	975	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
12	Auto-car. .... (12) L	6600	156	124	30000	13000	10	50	20D	975	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
13	Auto-car. .... (13) M	7200	156	124	30000	13000	10	50	20D	975	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
14	Auto-car. .... (14) N	7800	156	124	30000	13000	10	50	20D	975	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
15	Auto-car. .... (15) O	8400	156	124	30000	13000	10	50	20D	975	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
16	Auto-car. .... (16) P	9000	156	124	30000	13000	10	50	20D	975	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
17	Auto-car. .... (17) Q	9600	156	124	30000	13000	10	50	20D	975	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
18	CD 4TR. .... (1) A	5700	145	164	45000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
19	CD 4TR. .... (2) B	5100	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
20	CD 4TR. .... (3) C	5700	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
21	CD 4TR. .... (4) D	6200	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
22	CD 4TR. .... (5) E	6800	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
23	CD 4TR. .... (6) F	7400	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
24	CD 4TR. .... (7) G	7500	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
25	CD 4TR. .... (8) H	8200	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
26	CD 4TR. .... (9) I	8800	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
27	CD 4TR. .... (10) J	9400	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
28	e.u.s. (1) UDF	4600	145	164	45000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
29	e.u.s. (2) UDF	5200	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
30	e.u.s. (3) UDF	5800	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
31	e.u.s. (4) UDF	6400	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
32	e.u.s. (5) UDF	7000	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
33	e.u.s. (6) UDF	7600	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
34	e.u.s. (7) UDF	8200	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
35	e.u.s. (8) UDF	8800	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
36	e.u.s. (9) UDF	9400	145	164	50000	9655	9	75	20D	1050	20	Own 453	6-4	5	4	4	243	5	8	209	97	2200	7	24	12	Y Cla 200VO	5	Own RLL	2F	H	** 6.8	Tim 31008	T
37	e.u.s. (10) UDF	10000	145	164	50000	9655	9	75	20D	1050	20	Own																					

(x) Delivered at Factory Price. Includes all Federal Taxes but does not include any state and/or local taxes. Chevrolet (x) Export rating 4816 lbs. 5 For use with economy engine at extra cost.

MARCH 1982

Line No.	MAKE AND MODEL	GENERAL (See Keynote)			TIRE SIZES			TRANSMISSION			REAR AXLE			FRONT AXLE			BRAKES			FRAME		
		Tons/Price	Chassis Price	Wheelbase	Max. Weight	Gross Weight	Gross Weight	Front Pneumatic	Rear Pneumatic	Main Bearings	Differential Bearings	Front Pneumatic	Rear Pneumatic									
Line No.	MAKE AND MODEL	Dimensions			Dimensions			Dimensions			Dimensions			Dimensions			Dimensions			Dimensions		
		Side Rear	Side Front	Side Total	Front	Rear	Total	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	
1	Fargo. (E) FNH-1	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	210	67	148	70-3000	4-24X5	N	NP 36700	3	Own	Hy 1	3-70-4-75	Own	251	C	
2	(E) FNH-2	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36700	4	Own	Hy 1	3-70-4-75	Own	231	C	
3	(E) FNH-3	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	4	Own	Hy 1	3-70-4-75	Own	233	A	
4	(E) FNH-4	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	4	Own	Hy 1	3-70-4-75	Own	233	CX	
5	(E) FNH-5	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	4	Own	Hy 1	3-70-4-75	Own	233	CX	
6	(E) FNH-6	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
7	(E) FH-1	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
8	(E) FH-2	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
9	(E) FH-3	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
10	(E) FH-4	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
11	(E) FH-5	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
12	(E) FH-6	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
13	(E) FH-7	4500	6,00/16S	Own	6,00/16S	6,00/16S	12,00/32	70	100	168	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
14	(D) FGZ-6	2488	133/220	150000	7,00/20D	7,00/20D	12,00/32	3437	50	120	70-3000	4-24X5	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX	
15	Federal	505	111/128	128	2425	6,00/16D	7,50/17	Con. F4140	4-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
16		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
17		505	111/128	128	2425	6,00/16D	7,50/17	Con. F4140	4-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
18		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
19		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
20		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
21		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
22		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
23		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
24		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
25		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
26		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
27		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
28		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
29		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
30		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
31		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
32		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
33		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
34		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
35		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
36		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
37		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
38		505	111/128	128	2425	6,00/16D	7,50/17	Con. QNB-3	6-3-4-4	140/6.0	1017	52-2500	3-24X4	N	NP 36750	3	Own	Hy 1	3-70-4-75	Own	233	CX
39	Ford Regular	917T	580	134	750/20	750/20	150/108	Own	248	6-3-3	228	6-2	...	...	4	24X4	Own	5	Own	5	141H	
40	Ford Regular	917T	602	157	750/20	750/20	150/108	Own	248	6-3-3	228	6-2	...	...	4	24X4	Own	5	Own	5	141H	
41	Ford Regular	917T	630	157	750/20	750/20	150/108	Own	248	6-3-3	228	6-2	...	...	4	24X4	Own	5	Own	5	141H	
42	Ford Regular	917T	670	157	750/20	750/20	150/108	Own	248	6-3-3	228	6-2	...	...	4	24X4	Own	5	Own	5	141H	
43	COE	911W	720	157	750/20	750/20	150/108	Own	248	6-3-3	228											



Line 2 Number	MAKE AND MODEL	GENERAL (See Keynote)		ENGINE DETAILS				TIRES SIZES		FRONT AXLE		REAR AXLE		SERVICE		FRAME	
		Front	Price	Chassis	Price	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear
1 Mack (a) ... ED ...	675 120 136 ...	3800 6.00/178	6.50/17	Own EN11	6-3 1/2 x 4 1/2	210 5.8 145	67-30000	4 2 1/2 x 6	N WGT27	3 Cia RA40	SF	H 5-12-6-33	Cia FA18	52	7-3 x 3 1/2	T	
2 ... EF ...	1195 133 193 ...	4500 6.00/208	7.50/20	Own F10	6-3 1/2 x 4 1/2	213 5.7 166	7-2 3/4 x 12	N WGT28	4 Tim RA11	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
3 ... EG ...	1195 133 193 ...	5257 6.00/200	8.50/20	Own F11	6-3 1/2 x 4 1/2	217 5.7 188	8-3/4 x 12	N WGT29	4 Tim RA16	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
4 ... EH ...	12095 146 194 ...	5300 6.00/200	9.00/20	Own B12	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 12	N WGT30	5 Tim RA21	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
5 ... EH ...	12245 146 194 ...	6500 7.00/200	9.00/20	Own B13	6-3 1/2 x 4 1/2	209 5.4 210	9-3/4 x 10	N WGT31	5 Tim RA26	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
6 ... EH ...	12360 146 194 ...	7000 8.25/200	9.00/20	Own B14	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT32	5 Own EM	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
7 ... EM ...	1060 146 210 ...	7000 8.25/200	9.00/20	Own B15	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT33	5 Own EM	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
8 ... EM ...	1060 146 210 ...	7000 8.25/200	9.00/20	Own B16	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT34	5 Own EM	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
9 ... EM ...	1060 146 210 ...	7000 8.25/200	9.00/20	Own B17	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT35	5 Own EM	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
10 ... EQ ...	2093 146 194 ...	7000 8.25/200	9.00/20	Own B18	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT36	5 Own EM	SF	H 4-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
11 ... BM ...	4250 150 153 ...	9550 9.00/200	10.50/20	Own C1	6-4 1/2 x 4 1/2	415 5.0 270	10-3/4 x 12	N WGT37	5 Own CF	SF	H 6-31-8-64	Own BM	84	10 1/2 x 5 1/2	T		
12 ... BM ...	5250 171 225 ...	9550 9.00/200	11.25/24	Own C1	6-3 1/2 x 4 1/2	213 5.7 166	10-3/4 x 12	N WGT38	4 Tim RA11	SF	H 5-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
13 ... BM ...	1180 171 225 ...	5125 6.00/200	7.50/20	Own F12	6-3 1/2 x 4 1/2	213 5.7 166	10-3/4 x 12	N WGT39	4 Tim RA16	SF	H 5-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
14 ... BM ...	1390 107 162 ...	5400 6.00/200	8.25/20	Own F13	6-3 1/2 x 4 1/2	211 5.7 188	8-3/4 x 12	N WGT40	5 Tim RA21	SF	H 5-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
15 ... BM ...	1390 107 162 ...	5625 6.50/200	8.25/20	Own F14	6-3 1/2 x 4 1/2	209 5.7 200	8-3/4 x 12	N WGT41	5 Tim RA26	SF	H 5-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
16 ... BM ...	1370 108 162 ...	6300 7.00/200	9.00/20	Own B15	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT42	5 Own EM	SF	H 5-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
17 ... BM ...	1370 108 162 ...	7755 7.50/200	9.00/20	Own B16	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT43	5 Own EM	SF	H 5-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
18 ... BM ...	1370 108 162 ...	8000 8.25/200	9.00/20	Own B17	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT44	5 Own EM	SF	H 5-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
19 ... BM ...	1370 108 162 ...	8000 8.25/200	9.00/20	Own B18	6-3 1/2 x 4 1/2	210 5.4 210	9-3/4 x 10	N WGT45	5 Own EM	SF	H 5-14-6-8-6	Own FA12	52	7-1/2 x 3 1/2	T		
20 ... C (e.b.s.) EC ...	3600 108 171 ...	7500 7.50/200	9.00/20	Own B19	6-3 1/2 x 5 1/2	310 5.4 210	9-3/4 x 10	N WGT46	5 Own EM	SF	H 5-14-6-8-6	Own EC	84	8 1/2 x 3 1/2	T		
21 ... C (e.b.s.) EB ...	4250 150 171 ...	8200 8.25/200	10.50/20	Own C20	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT47	5 Own EM	SF	H 5-14-6-8-6	Own EB	84	8 1/2 x 3 1/2	T		
22 ... C (e.b.s.) CH ...	5150 150 189 ...	10800 9.00/200	10.50/20	Own C21	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT48	5 Own EM	SF	H 5-14-6-8-6	Own CH	84	8 1/2 x 3 1/2	T		
23 ... C (e.b.s.) CJ ...	6100 150 189 ...	10800 9.00/200	10.50/20	Own C22	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT49	5 Own EM	SF	H 5-14-6-8-6	Own CJ	84	8 1/2 x 3 1/2	T		
24 ... C (e.b.s.) EDU ...	6175 150 189 ...	10800 9.00/200	10.50/20	Own C23	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT50	5 Own EM	SF	H 5-14-6-8-6	Own EDU	84	8 1/2 x 3 1/2	T		
25 ... C (e.b.s.) EGD ...	6250 150 189 ...	10800 9.00/200	10.50/20	Own C24	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT51	5 Own EM	SF	H 5-14-6-8-6	Own EGD	84	8 1/2 x 3 1/2	T		
26 ... C (e.b.s.) EHD ...	6250 150 189 ...	10800 9.00/200	10.50/20	Own C25	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT52	5 Own EM	SF	H 5-14-6-8-6	Own EHD	84	8 1/2 x 3 1/2	T		
27 ... C (e.b.s.) EHU ...	6250 150 189 ...	10800 9.00/200	10.50/20	Own C26	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT53	5 Own EM	SF	H 5-14-6-8-6	Own EHU	84	8 1/2 x 3 1/2	T		
28 ... C (e.b.s.) EJHD ...	6250 150 189 ...	10800 9.00/200	10.50/20	Own C27	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT54	5 Own EM	SF	H 5-14-6-8-6	Own EJHD	84	8 1/2 x 3 1/2	T		
29 ... C (e.b.s.) EJUD ...	6250 150 189 ...	10800 9.00/200	10.50/20	Own C28	6-3 1/2 x 5 1/2	315 5.0 270	10-3/4 x 10	N WGT55	5 Own EM	SF	H 5-14-6-8-6	Own EJUD	84	8 1/2 x 3 1/2	T		
30 ... D (D) ... BMD ...	5750 150 225 ...	10000 9.00/200	10.50/20	Own C29	6-4 1/2 x 5 1/2	310 5.0 270	10-3/4 x 10	N WGT56	6 Own CCF	SF	H 5-14-6-8-6	Own BM	84	10 1/2 x 3 1/2	T		
31 ... D (D) ... BXD ...	6500 171 225 ...	10000 9.00/200	11.25/24	Own C30	6-4 1/2 x 5 1/2	310 5.0 270	10-3/4 x 10	N WGT57	2 Tim RA11	SF	H 5-14-6-8-6	Own BX	84	10 1/2 x 3 1/2	T		
32 ... D (D) ... CJ ...	6500 171 225 ...	10000 9.00/200	11.25/24	Own C31	6-4 1/2 x 5 1/2	310 5.0 270	10-3/4 x 10	N WGT58	4 Tim RA16	SF	H 5-14-6-8-6	Own CJ	84	10 1/2 x 3 1/2	T		
33 ... D (D) ... EHDU ...	6260 107 162 ...	6350 6.00/200	8.25/20	Own C32	6-3 1/2 x 4 1/2	212 5.7 166	10-3/4 x 12	N WGT59	5 Tim RA21	SF	H 5-14-6-8-6	Own EHDU	84	8 1/2 x 3 1/2	T		
34 ... D (D) ... EJHD ...	6260 107 162 ...	6350 6.00/200	8.25/20	Own C33	6-3 1/2 x 4 1/2	212 5.7 166	10-3/4 x 12	N WGT60	5 Tim RA26	SF	H 5-14-6-8-6	Own EJHD	84	8 1/2 x 3 1/2	T		
35 ... D (D) ... EHU ...	6260 107 162 ...	6350 6.00/200	8.25/20	Own C34	6-3 1/2 x 4 1/2	212 5.7 166	10-3/4 x 12	N WGT61	5 Own EM	SF	H 5-14-6-8-6	Own EHU	84	8 1/2 x 3 1/2	T		
36 ... D (D) ... EJUD ...	6260 107 162 ...	6350 6.00/200	8.25/20	Own C35	6-3 1/2 x 4 1/2	212 5.7 166	10-3/4 x 12	N WGT62	5 Own EM	SF	H 5-14-6-8-6	Own EJUD	84	8 1/2 x 3 1/2	T		
37 ... D (D) ... EQUD ...	4970 108 162 ...	8000 8.25/200	9.00/20	Own C36	6-3 1/2 x 5 1/2	317 5.0 270	10-3/4 x 12	N WGT63	5 Own EM	SF	H 5-14-6-8-6	Own EQUD	84	8 1/2 x 3 1/2	T		
38 ... D (D) ... EQUD (e.b.s.) CJD ...	4745 146 194 ...	8800 8.25/200	9.00/20	Own C37	6-3 1/2 x 5 1/2	317 5.0 270	10-3/4 x 12	N WGT64	5 Own EM	SF	H 5-14-6-8-6	Own EQUD	84	8 1/2 x 3 1/2	T		
39 ... D (D) ... CJD ...	7350 139 189 ...	11000 9.00/200	10.50/20	Own C38	6-3 1/2 x 5 1/2	317 5.0 270	10-3/4 x 12	N WGT65	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T		
40 Plymouth (e.) PT-57 ...	5000 171 225 ...	11000 9.00/200	10.50/20	Own C39	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT66	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T		
41 ... Plymouth (e.) PT-81 ...	505 116 4000 ...	18500 6.00/168	6.00/168	Own C40	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT67	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T		
42 Ree (V) ...	4-50 1/2 ...	579 114 126 ...	2043 6.00/168	6.50/16	Own C41	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT68	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T	
43 ... Ree (V) ...	4-50 1/2 ...	613 114 126 ...	2043 6.00/168	6.50/16	Own C42	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT69	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T	
44 ... Ree (V) ...	4-50 1/2 ...	665 114 126 ...	2043 6.00/168	6.50/16	Own C43	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT70	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T	
45 ... Ree (V) ...	4-50 1/2 ...	665 114 126 ...	2043 6.00/168	6.50/16	Own C44	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT71	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T	
46 ... A4-1/CA-4 ...	652 114 126 ...	652 114 126 ...	2043 6.00/168	6.50/16	Own C45	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT72	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T	
47 ... A4-1/CA-4 ...	652 114 126 ...	652 114 126 ...	2043 6.00/168	6.50/16	Own C46	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT73	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T	
48 ... A4-1/CA-4 ...	652 114 126 ...	652 114 126 ...	2043 6.00/168	6.50/16	Own C47	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT74	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2 x 3 1/2	T	
49 ... A4-1/CA-4 ...	652 114 126 ...	652 114 126 ...	2043 6.00/168	6.50/16	Own C48	6-3 1/2 x 4 1/2	317 5.0 270	10-3/4 x 12	N WGT75	6 Own CCF	SF	H 5-14-6-8-6	Own CJD	84	8 1/2		

84	.....	38A 5-7	4100 1600 1010	10/50/20	Wau	8070 9/00/2010	10/50/20	Wau	5 Trim	YBL	84	10x3 1/2x4		
85	.....	31A 5-8	5500 1600 2010	10/50/20	Wau	9400 9/00/2010	10/50/20	Wau	5 Trim	YBL	84	10x3 1/2x4		
86	.....	1-COE 2 1/2	10/50/20	Wau	4600 6/00/2010	10/50/20	Wau	5 Trim	YBL	84	10x3 1/2x4			
87	.....	2-COE 2 1/2	10/50/20	Wau	4600 9/00/2010	10/50/20	Wau	5 Trim	YBL	84	10x3 1/2x4			
88	.....	3-COE 2 1/2	10/50/20	Wau	4600 10/00/2010	10/50/20	Wau	5 Trim	YBL	84	10x3 1/2x4			
89	.....	4-COE 2 1/2	10/50/20	Wau	4600 11/00/2010	10/50/20	Wau	5 Trim	YBL	84	10x3 1/2x4			
90	Strudebaker. (* L5 1/2	650 110	4500 6,000 165	650 110	Own H	6,3 1/2x4	2266.6 0 1/2	90 3400 4 2 1/2x5 1/2	N WG T88	3 Spi 41-2	HY	H 4.55-4 82		
91	.....	650 110	4500 6,000 165	650 110	Own OT	6,3 1/2x4	2266.6 0 1/2	79 3200 4 2 1/2x5 1/2	N WG T9	4 Tim 5441	HY	H 4.55-4 82		
92	.....	710 130	62 12000	750 20	Her JXB	6,3 1/2x4	2263.5 8 1/2	80 2800 7 2 1/2x10 1/2	Y WG T9	5 Tim 9440	HY	H 4.5 82		
93	.....	710 130	62 12000	750 20	Her JXB	6,3 1/2x4	2263.5 8 1/2	80 2800 7 2 1/2x10 1/2	Y WG T9	4 Tim 5441	HY	H 4.55-4 82		
94	.....	710 130	62 12000	750 20	Her JXB	6,3 1/2x4	2263.5 8 1/2	80 2800 7 2 1/2x10 1/2	Y WG T9	5 Tim 9440	HY	H 4.55-4 82		
95	.....	710 130	62 12000	750 20	Her JXB	6,3 1/2x4	2263.5 8 1/2	80 2800 7 2 1/2x10 1/2	Y WG T9	4 Tim 5441	HY	H 4.55-4 82		
96	.....	710 130	62 12000	750 20	Her JXB	6,3 1/2x4	2263.5 8 1/2	80 2800 7 2 1/2x10 1/2	Y WG T9	5 Tim 9440	HY	H 4.55-4 82		
97	.....	710 130	62 12000	750 20	Her JXB	6,3 1/2x4	2263.5 8 1/2	80 2800 7 2 1/2x10 1/2	Y WG T9	4 Tim 5441	HY	H 4.55-4 82		
98	.....	710 130	62 12000	750 20	Her JXB	6,3 1/2x4	2263.5 8 1/2	80 2800 7 2 1/2x10 1/2	Y WG T9	5 Tim 9440	HY	H 4.55-4 82		
99	.....	710 130	62 12000	750 20	Her JXB	6,3 1/2x4	2263.5 8 1/2	80 2800 7 2 1/2x10 1/2	Y WG T9	4 Tim 5441	HY	H 4.55-4 82		
100	.....	(c.e.) K30M 3	1985 10/166	20000	5800 7/30/2010	9/75/20	Her WXC3	6 4 1/2x4	80 2800 7 2 1/2x13 1/2	Y WG T9	5 Tim 5300	HY	H 6 1-7 8 32507	
101	Trucksell	710H 2 1/2	117 1450	4475 7/30/2010	7/50/20	Chevrolet	6-3 1/2x3	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2	
102	.....	(C) TRC-100H 2 1/2	1329 13 231	15000	4475 7/30/2010	8/25/20	Chevrolet	6-3 1/2x3	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2
103	.....	(C) TRC-100H 2 1/2	1329 13 231	15000	4475 7/30/2010	8/25/20	Chevrolet	6-3 1/2x3	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2
104	.....	(C) TRC-100H 2 1/2	1329 13 231	15000	4475 7/30/2010	8/25/20	Chevrolet	6-3 1/2x3	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2
105	.....	(C) TRC-100H 2 1/2	1329 13 231	15000	4475 7/30/2010	8/25/20	Chevrolet	6-3 1/2x3	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2
106	.....	(C) TRC-100H 2 1/2	1329 13 231	15000	4475 7/30/2010	8/25/20	Chevrolet	6-3 1/2x3	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2
107	.....	(C) TRC-100H 2 1/2	1329 13 231	15000	4475 7/30/2010	8/25/20	Chevrolet	6-3 1/2x3	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2
108	(c.e.) K20M 2	2530 130	80 14500	4475 7/30/2010	8/25/20	Her JXD	6-3 1/2x4	263.5 18 7	80 2800 7 2 1/2x10 1/2	Y WG T9	5 Tim 9440	HY	H 4.55-4 82	
109	.....	K20M 2	2530 130	80 14500	4475 7/30/2010	8/25/20	Her JXD	6-3 1/2x4	263.5 18 7	80 2800 7 2 1/2x10 1/2	Y WG T9	4 Tim 5441	HY	H 4.55-4 82
110	(c.e.) K20M 2	2530 130	80 14500	4475 7/30/2010	8/25/20	Her JXD	6-3 1/2x4	263.5 18 7	80 2800 7 2 1/2x10 1/2	Y WG T9	5 Tim 9440	HY	H 4.55-4 82	
111	Warford. (C) BC-9 4-8	168 12 127	1976 9/00/2010	7/50/20	Ford V8	6-3 1/2x4	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2		
112	.....	(C) BC-9 4-8	168 12 127	1976 9/00/2010	7/50/20	Ford V8	6-3 1/2x4	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2	
113	.....	(C) BC-9 5-10	215 15 198	26500	6100 7/00/2010	8/25/20	Ford V8	6-3 1/2x4	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2
114	.....	(C) BC-9 5-10	215 15 198	26500	6100 7/00/2010	8/25/20	Ford V8	6-3 1/2x4	216.6 2 1/2	78 3200 4 2 1/2x5 1/2	N Chevy	4 Eat 1265	SED	U 5.82 8 1/2
115	White. ....	500 1-2	950 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
116	.....	700 1-2	1095 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
117	.....	700 1-2	1095 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
118	.....	700 1-2	1095 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
119	.....	700 1-2	1095 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
120	.....	700 1-2	1095 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
121	.....	700 1-2	1095 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
122	.....	700 1-2	1095 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
123	.....	700 1-2	1095 130 196	....	363/6 6,00 208	8/25/20	Own 221	6-3 1/2x4	221.5 8 1/2	68-3000 7 2 1/2x10 1/2	Y Own	4 Own	SF	5.66-6 66
124	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
125	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
126	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
127	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
128	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
129	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
130	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
131	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
132	.....	710 8 6	3175 136 226	....	6765 8 25/2010	9/75/20	Own 318	6-3 1/2x4	318.6 3 245	60-3000 7 2 1/2x10 1/2	Y Own	5 Own	SF	5.72-7 14
133	.....	722 8 10	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
134	.....	691 1-2	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
135	.....	722 8 10	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
136	.....	722 8 10	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
137	.....	722 8 10	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
138	.....	722 8 10	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
139	.....	722 8 10	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
140	.....	722 8 10	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
141	.....	691 1-2	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5	134-2400 7 2 1/2x13 1/2	Y Own	4 Own	SF	5.66-6 48
142	.....	722 8 10	5500 134 219	....	9300 9 75/2010	10/50/24	Own 270	6-4 1/2x4	529.5 15 5					

GENERAL (See Keynote)		TIRE SIZES			ENGINE DETAILS			TRANSMISSION			REAR AXLE			FRONT AXLE			BRAKES			FRAME		
		D-dual rear	S-single rear	Front and rear	Make and Model	Front and rear	Brake, P.M.	Stroke, Cyl. dia.	Displacement	Given	Max. Brake Ratio	Frontard Spd's	Make and Model	Frontard Spd's	Make and Model	Frontard Spd's	Make and Model	Frontard Spd's	Make and Model	Frontard Spd's	Make and Model	
1 F. W. D. ....	T26	2900	144	26000	6000	8.25	201D	9.00-20	Wau BIK	6-3/4x4/4	282.5 2.188	85-3200	7-2 1/2x10 1/2	Y Fu 5B30	5T 1.55/43HX1 SF	H 4-8 0	W's F33-HS	286	452 G	T4		
2	(cont.)	132	4830	134	32000	10500	9.05	201D	9.00-22	Wau MIRK	6-3/4x4/4	318.5 2.370	90-2400	7-2 3/4x11 1/2	Y Fu 5A330	5T Own HU	H 4-8 0	W's F33-HS	286	452 G	T4	
3	140	5530	134	34000	10500	9.05	201D	9.00-22	Wau RBR	6-3/4x4/4	317.5 4.369	90-2400	7-2 3/4x11 1/2	Y Fu 5A220	5T Own U	H 4-8 0	W's F33-HS	286	452 G	T4		
4	160	6120	134	36000	10500	9.05	201D	9.00-22	Wau RBR	6-3/4x4/4	317.5 4.369	90-2400	7-2 3/4x11 1/2	Y Fu 7B351	5T Own MF	H 4-8 0	W's F33-HS	286	452 G	T4		
5	175	6120	134	36000	10500	9.05	201D	9.00-22	Wau RBR	6-3/4x4/4	317.5 4.369	90-2400	7-2 3/4x11 1/2	Y Fu 7B351	5T Own MF	H 4-8 0	W's F33-HS	286	452 G	T4		
6	T72	6120	134	36000	10500	9.05	201D	9.00-22	Wau RBR	6-3/4x4/4	317.5 4.369	90-2400	7-2 3/4x11 1/2	Y Fu 7B351	5T Own MF	H 4-8 0	W's F33-HS	286	452 G	T4		
7 F. W. D. ....	44-4 1/2-5	5425	150	160	24000	9600	10.50	209S	10.50-20	Wau 6SHL	6-4 1/2x4/4	302.4 6.300	7-3000	7-3x12 1/2	Y Fu 5A220	5W's F2900	2F H 5-0-7	W's F213	286	452 G	T4	
8	45-4 1/2-5	6125	150	160	29000	11000	10.50	208S	10.50-20	Wau 6SHL	6-4 1/2x4/4	318.5 6.300	7-3000	7-3x12 1/2	Y Fu 5A220	5W's F2900	2F H 5-0-7	W's F213	286	452 G	T4	
9	46-4 1/2-5	8780	160	170	35000	11800	11.50	208S	11.50-20	Wau 6SHL	6-4 1/2x4/4	318.5 6.300	7-3000	7-3x12 1/2	Y Fu 5A220	5W's F2900	2F H 5-0-7	W's F213	286	452 G	T4	
10 Indiana ....	12 X-1 1/2-2	110	131	109	109	1.00	201D	6.50-20D	Her IXC	6-3 3/4x4/4	282.5 5.176	73-2800	7-2 1/2x10 1/2	Y BL 2B41	4 Tim 53210 SF	H 5-14 5 6	W's F30B	286	452 G	T4		
11	13	160	150	150	150	1.00	201D	6.50-20D	Her IXC	6-3 3/4x4/4	282.5 5.176	73-2800	7-2 1/2x10 1/2	Y BL 2B41	4 Tim 53210 SF	H 5-14 5 6	W's F30B	286	452 G	T4		
12	14	160	150	150	150	1.00	201D	6.50-20D	Her IXC	6-3 3/4x4/4	282.5 5.176	73-2800	7-2 1/2x10 1/2	Y BL 2B41	4 Tim 53210 SF	H 5-14 5 6	W's F30B	286	452 G	T4		
13	15	160	150	150	150	1.00	201D	6.50-20D	Her IXC	6-3 3/4x4/4	282.5 5.176	73-2800	7-2 1/2x10 1/2	Y BL 2B41	4 Tim 53210 SF	H 5-14 5 6	W's F30B	286	452 G	T4		
14	16	160	150	150	150	1.00	201D	6.50-20D	Her IXC	6-3 3/4x4/4	282.5 5.176	73-2800	7-2 1/2x10 1/2	Y BL 2B41	4 Tim 53210 SF	H 5-14 5 6	W's F30B	286	452 G	T4		
15	16	170	160	160	160	1.00	201D	6.50-20D	Her IXC	6-3 3/4x4/4	282.5 5.176	73-2800	7-2 1/2x10 1/2	Y BL 2B41	4 Tim 53210 SF	H 5-14 5 6	W's F30B	286	452 G	T4		
16	17	170	160	160	160	1.00	201D	6.50-20D	Her IXC	6-3 3/4x4/4	282.5 5.176	73-2800	7-2 1/2x10 1/2	Y BL 2B41	4 Tim 53210 SF	H 5-14 5 6	W's F30B	286	452 G	T4		
17 Kenworth ....	539	540	540	540	540	1.00	201D	7.75-24	Bud K128	6-4 3/4x4/4	279.5 3.302	109-2400	7-3x11 1/2	Y Fu 5A62	5W's F2900	2F H 5-7-8 40	W's F207	286	452 G	T4		
18	541	541	541	541	541	1.00	201D	7.75-24	Bud K128	6-4 3/4x4/4	279.5 3.302	109-2400	7-3x11 1/2	Y Fu 5A62	5W's F2900	2F H 5-7-8 40	W's F207	286	452 G	T4		
19	542	542	542	542	542	1.00	201D	7.75-24	Bud L0525	6-4 3/4x4/4	279.5 3.302	109-2400	7-3x11 1/2	Y Fu 5A62	5W's F2900	2F H 5-7-8 40	W's F207	286	452 G	T4		
20	542	542	542	542	542	1.00	201D	7.75-24	Bud L0525	6-4 3/4x4/4	279.5 3.302	109-2400	7-3x11 1/2	Y Fu 5A62	5W's F2900	2F H 5-7-8 40	W's F207	286	452 G	T4		
21 Marion-Hart	LD34-1/2	1445	113	113	113	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
22	23	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
23	24	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
24	25	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
25	26	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
26	27	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
27	28	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
28	29	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
29	30	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
30	31	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
31	32	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
32	33	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
33	34	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
34	35	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
35	36	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
36	37	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
37	38	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
38	39	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
39	40	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
40	41	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
41	42	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
42	43	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
43	44	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2 4/5x5 1/2	N Ford	4 Ford	S/4	U	** 4-44 Own LD1	264	448	T4	
44	45	1585	1585	1585	1585	1.00	15/58	271.5 15/58	For V8	8-3 1/2x3 1/2	221.6 1.150	85-3300	3-2									

Automotive Industries											
76	654	4R	150	130	130	130	130	130	130	130	130
77	654	TO	130	130	130	130	130	130	130	130	130
77	654	TC	130	130	130	130	130	130	130	130	130
79	(b) 652	UD	2F	120	120	120	120	120	120	120	120
80		652	UN	2F	120	120	120	120	120	120	120
81	(a) 652	UD	2F	120	120	120	120	120	120	120	120
82		652	UN	2F	120	120	120	120	120	120	120
83	654	UT	2F	120	120	120	120	120	120	120	120
84	654	UT	2F	120	120	120	120	120	120	120	120
85	656	Corbit	3S8B2	2F	6-8	6-8	6-8	6-8	6-8	6-8	6-8
86	656	ASB2	4R	2F	6-8	6-8	6-8	6-8	6-8	6-8	6-8
87	656	ASB2	4R	2F	6-8	6-8	6-8	6-8	6-8	6-8	6-8
88	656	ASB2	2F	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
89	656	ASB2	2F	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
90	656	ASB4	4R	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
91	656	ASB4	4R	8-10	8-10	8-10	8-10	8-10	8-10	8-10	8-10
92	656	ASB4	4R	8-10	8-10	8-10	8-10	8-10	8-10	8-10	8-10
93	656	ASB6	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
94	656	ASB6	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
95	656	ASB6	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
96	656	ASB6	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
97	656	ASD6	6-10	10	10	10	10	10	10	10	10
98	Dart	1000	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7
99	Dart	1000	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8
100	Dart	1000	7-8	7-10	7-10	7-10	7-10	7-10	7-10	7-10	7-10
102	Federal	202	2R	2.4	1950	162	215	215	215	215	215
103	Federal	202	2R	2.4	1950	162	215	215	215	215	215
104	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
105	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
106	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
107	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
108	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
109	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
110	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
111	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
112	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
113	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
114	(e.o.e) 502	4R	5-8	2554	162	215	215	215	215	215	215
115	F. W. D. & M. J. N. X. 10	1000	184	204	1000	1200	1200	1200	1200	1200	1200
116	F. W. D. & M. J. N. X. 10	1000	184	204	1000	1200	1200	1200	1200	1200	1200
117	Hop	199	4R	10-12	6675	162	215	215	215	215	215
118	Hop	199	4R	10-12	6675	162	215	215	215	215	215
119	Hop	199	4R	10-12	6675	162	215	215	215	215	215
120	Hop	199	4R	10-12	6675	162	215	215	215	215	215
121	(D) D99MA	4R	12-14	1300	170	175	175	175	175	175	175
122	98CD	1000	150	150	90000	11200	1050	200	1200	1200	1200
123	(D) D96CD	1000	150	150	90000	11200	1050	200	1200	1200	1200
124	(D) D99MA	1000	150	150	90000	11200	1050	200	1200	1200	1200
125	(D) D99MA	1000	150	150	90000	11200	1050	200	1200	1200	1200
126	(D) D99MA	1000	150	150	90000	11200	1050	200	1200	1200	1200
127	(D) D99MA	1000	150	150	90000	11200	1050	200	1200	1200	1200
128	Indiana	16X6	6-3	100	100	100	100	100	100	100	100
129	Indiana	16X6	6-3	100	100	100	100	100	100	100	100
130	Indiana	16X6	6-3	100	100	100	100	100	100	100	100
131	Indiana	16X6	6-3	100	100	100	100	100	100	100	100
132	Internal	11-26	2F	11-26	2F	11-26	2F	11-26	2F	11-26	2F
133	Internal	11-26	2F	11-26	2F	11-26	2F	11-26	2F	11-26	2F
134	Internal	11-26	2F	11-26	2F	11-26	2F	11-26	2F	11-26	2F
135	Internal	11-26	2F	11-26	2F	11-26	2F	11-26	2F	11-26	2F
136	Internal	11-26	2F	11-26	2F	11-26	2F	11-26	2F	11-26	2F
137	Internal	11-26	2F	11-26	2F	11-26	2F	11-26	2F	11-26	2F
138	DS-246-T	2F	3060	161	215	9710	750	200	1000	1000	1000
139	DS-246-T	2F	3060	161	215	9710	750	200	1000	1000	1000
140	DR-346-T	2F	5900	161	215	9710	750	200	1000	1000	1000
141	DR-346-T	2F	5900	161	215	9710	750	200	1000	1000	1000
142	DR-436-T	4R	10500	900	200	10500	900	200	1000	1000	1000
143	DR-436-T	4R	10500	900	200	10500	900	200	1000	1000	1000
144	Ken-	(D) 506	4R	100	100	100	100	100	100	100	100
145	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
146	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
147	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
148	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
149	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
150	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
151	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
152	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
153	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
154	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
155	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
156	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
157	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
158	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
159	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
160	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
161	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
162	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
163	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
164	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
165	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
166	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
167	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
168	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
169	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
170	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
171	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
172	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
173	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
174	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
175	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
176	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
177	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
178	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
179	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
180	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
181	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
182	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
183	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
184	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
185	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
186	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
187	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
188	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
189	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
190	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
191	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
192	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
193	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
194	Ken-	(D) 523	4R	100	100	100	100	100	100	100	100
19											

## *Automotive Industries*

February 25, 1935

MECHANICAL SPECIFICATIONS AMERICAN TRUCKS—1939

(\*) Price includes chassis and case

219

## Leading Truck Fleets in United States

No. of Trac- tors	No. of Trac- tors	Cars	No. of Trac- tors		Cars	No. of Trac- tors	
			Trail- ers	Trucks		Trail- ers	Trucks
Bell. Tele. Co's. ....	15,800	4,380	Cn. Ed. N. Y. & Af. Co's. ....	920	428	Langendorf United Bk. ....	440
Standard Oil Co., N. J. ....	12,000	4,000	Interstate Bk. Corp. ....	891	14	So. Cal. Edison Co. ....	410
R-way Express Agency. ....	9,243	556	Standard Oil Co., Ohio. ....	558	2	Gen. Petroleum Corp. ....	420
Nat'l. Hy. Prod. Corp. ....	7,146	995	Am. Gas. & Elec. Corp. ....	836	2	R. H. Macy & Co. ....	408
Borden Co. ....	6,5793	420	Golden State Co., Ltd. ....	840	14	Columbia Baking Co. ....	5
Standard Oil Co., Ind. ....	6,563	21	Sinclair Refining Corp. ....	829	17	Crane Co. ....	394
Socony-Vacuum Oil Co. ....	4,273	87	Western Dy. Prod. Co. ....	825	7	Consumers Power Co. ....	383
Continental Baking Co. ....	3,911	87	Humble Oil & Rlg. Co. ....	727	34	City Baking Co. ....	382
General Baking Co. ....	3,293	27	Humboldt Petroleum Co. ....	809	318	Cly. Ice & Fl. Co., Cleved. ....	353
Swift & Co. ....	2,950	120	Keeshing Tr. Fgt. Lines. ....	759	75	Heims Bakers Co. ....	332
Pine. Oil Co. ....	2,500	50	Phila. Dairy Prod. Co. ....	750	20	Wagner Baking Co. ....	345
Cities Service. ....	2,900	... ..	H. P. Hood & Sons, Inc. ....	759	6	American Stores Co. ....	336
Standard Brands, Inc. ....	2,565	4	U. S. Trucking Corp. ....	674	33	Drake Bakers, Inc. ....	340
Standard Baking Co. ....	2,512	4	Loose-Willes Biscuit Co. ....	700	5	Western Union Tel. Co. ....	341
Armour & Co. ....	2,291	... ..	Magnolia Petrol. Co. ....	523	12	N. Y. Pwr. & Lgt. Corp. ....	328
Hertz. Drive Yourself. Stns. ....	2,149	... ..	Gordon Baking Co. ....	653	32	Consol. Motor Lines. ....	320
Middle West Srvce Co. ....	1,951	... ..	Imperial Oil Co. ....	659	23	Burns Brothers Co. ....	324
Shell Petroleum Corp. ....	1,146	25	Stand. Gas & Elec. Co. ....	649	14	Postal Tel. Co. ....	1
Shell-Union Oil Corp. ....	1,146	... ..	Sun Oil Co. ....	477	22	Pittsburgh Plate G. Co. ....	320
Standard Oil Co., Calif. ....	1,587	2	General Foods Corp. ....	575	166	Fed. Water Serv. Corp. ....	295
The Texas Co. ....	1,583	11	B. F. Goodrich Co. ....	555	11	Fischer Baking Co. ....	308
Jewel Tea Co. ....	1,551	... ..	American Ice Co. ....	551	6	Petrol. Heat & Pwr. Co. ....	294
National Biscuit Co. ....	1,530	6	American Bakeries Co. ....	530	10	J. C. Spang Baking Co. ....	260
National Bakers of Amer. ....	1,500	5	National Baking Co. ....	548	20	Consol. Freight Lines. ....	275
Dugan Bros. ....	1,350	29	American Bakeries Co. ....	526	1	Commercial Motor Fgt. ....	252
Pacific Gas & Elec. Co. ....	1,307	3	Goodyear Tr. & Rub. Co. ....	516	12	Richfield Oil Corp. ....	140
Ice Cream Corp. ....	1,100	... ..	Kroger Groc. & Bk. Co. ....	100	17	Continental Oil Co. ....	17
Union Oil Co. ....	1,065	27	Philadelphia Elec. Co. ....	517	66	Gottfried Baking Co. ....	243
Atlantic Refining Co. ....	1,043	10	Consol. Laundries Corp. ....	502	11	Ohio Oil Co. ....	18
Half Oil Corp. ....	982	61	Fresno Baking Co. ....	491	3	Marshall Field & Co. ....	232
Judah Facing Co. ....	1,031	... ..	Concord Baking Co. ....	491	16	Shawting Bakers, Inc. ....	240
Hydrate Water Oil Co's. ....	970	1	Com. wealth Edison Co. ....	474	10	San Joaquin Lt. & Pw. Co. ....	226
Brink's Incorporatd. ....	968	... ..	Brink's Incorporatd. ....	474	2	Hoffman Beverage Co. ....	224
Dairymen's Leverage. ....	956	6	Brink's Incorporatd. ....	477	11	Liquid Carbonic Corp. ....	219
McCormick's Dist'r. & Bk. Co. ....	956	... ..	Dairymen's Leverage. ....	475	11	Liquid Carbonic Corp. ....	225

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## *Automotive Industries*

# AMERICAN TRACTORS WHEEL TYPE

## TRACK LAYING TYPE

## ABBREVIATIONS FOR WHEEL AND TRACK-LAYING TYPES

ADDITIONAL INFORMATION	
model	FK—Front Axle Knuckle
available	FM—Fairbanks Morse Co.
available	(g)—Bosch or Timken Injection
available	systems
available	G—Gasoline
available	(h)—Also 444 R.P.M.
available	Hero—Herrules
available	I—In Head (Valves)
available	IG—Internal Gear
available	(k)—Deo Injection system
available	Eis—Eismann
available	ES—Edison-Schildorf
available	K—Kersensee
available	Kn—Kingston
(f)—Also available in 20 in. diam.	
D—Distillate	DC—Drilled Crankshaft
DC—Drilled Crankshaft	Del—Delco-Elemey
Del—Delco-Elemey	DM—Driving Members
DO—Double Plate, in Oil	DO—Double Plate, in Oil
DOD—Diesel Oil or Distillate	Don—Donaldson
DP—Double Plate, dry	DP—Double Plate, dry
(e)—Also available in 10 in. diam.	(e)—Also available in 10 in. diam.
Eis—Eismann	
ES—Edison-Schildorf	
(f)—Also available in 20 in. diam.	
model	D—Dual
available	L—L Head (Valves)
available	(m)—Steel wheels 2750 lbs., Rubber
available	tires 3180 lbs.
available	Mal—Malory
available	MD—Multiple Dry Disk
available	MD—Multiple Dry Disk
available	MS—Marvin-Schebler
available	(n)—Steel wheels 2835 lbs., Rubber
available	tires 3650 lbs.
available	N—No or None
available	NR—Not Rated
O—Diesel Fuel	O—Optional
Op—Optional	(p)—Steel wheels 5035 lbs., Rubber
Sp—Single Plate, dry	tires 5450 lbs.
TD—Twin-Disk	P—Pivots on either wheel
Til—Tilston	(r)—Steel wheels 4220 lbs., Rubber
Un—United	tires 4620 lbs.
Var—Various widths	RF—Rotating Fork
Vor—Vortex	Ro—Rockford
WG—Worm Gear	S—Sprockets
Wi—Wico	SA—Swinging Axle
Y—Yes	Sch—Schebler
Zen—Zenith	
ZK—Zenith or Kingston	

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Automotive Industries

# AMERICAN STOCK CLUTCHES

MAKE AND MODEL	Designed For	Rated Torque Capacity (Lb. Ft.)	Type	Facing Material	DIAMETER OF FACING		Number of Facing	No. of Driving Members	No. of Driven Members	Disc or Plate Material	Number of Springs	PRESSURES (Lb.)			Overall Outside Diameter of Clutch (In.)	Flexible Hub Mounting	DRIVE TAKEN BY		Means of Adjustment	Is Clutch Brake Provided	Bell Housing (S. A. E. No's.)	Weight Complete (Lb.)			
					Outside (In.)	Inside (In.)						Total Spring Pressure	Fri. on Face	Per Sq. In. of Friction Surface	To Disengage at Thru Bearing		From Flywheel to Driving Members of Clutch	From Driven Members of Clutch to Clutch Shaft							
Borg & Beck..... 9A-7	C, T, Tr	(a) SP	W-M	9 $\frac{1}{4}$	6	2	2	1	St	9	1215	1215	28.7	275	11 $\frac{1}{8}$	Sg	Opt	L.O.P.	Splines	No	No	5	16.00		
Borg & Beck..... 9A-6	C, T, Tr	(a) SP	W-M	9 $\frac{1}{4}$	5 $\frac{1}{8}$	2	2	1	St	9	1215	1215	28.7	275	11 $\frac{1}{8}$	Sg	Opt	L.O.P.	Splines	No	No	5	16.50		
Borg & Beck..... 10A-7	C	210	SP	W-M	10	7	2	2	1	St	9	1395	1395	27.9	300	12 $\frac{1}{8}$	Sg	Opt	L.O.P.	Splines	No	No	5	19.35	
Borg & Beck..... 10A-6	T, Tr	160	SP	W-M	10	6 $\frac{1}{2}$	2	2	1	St	12	1395	1395	27.9	300	12 $\frac{1}{8}$	Sg	Opt	L.O.P.	Splines	No	No	5	19.50	
Borg & Beck..... 11A-6	C, T, B, Tr	(c) SP	W-M	11	6 $\frac{1}{2}$	2	2	1	St	12	1770	1770	27.0	365	13 $\frac{1}{8}$	Sg	Opt	L.O.P.	Splines	No	No	4	28.50		
Borg & Beck 12-Q & 12-OL	T, B, Tr	200	SP	Wo	11 $\frac{1}{2}$	7 $\frac{1}{4}$	2	2	1	St	1	300	1590	23.0	350	12 $\frac{1}{4}$	No	Opt	Pins	Splines	Sc	No	3	33.25	
Borg & Beck..... 13-Q	T, B, Tr	260	SP	Wo	12 $\frac{1}{2}$	7 $\frac{1}{4}$	2	2	1	St	1	300	1590	17.8	350	13 $\frac{1}{8}$	No	Opt	Pins	Splines	Sc	No	3	41.25	
Borg & Beck..... 14-Q	T, B, Tr	375	SP	Wo	13 $\frac{1}{8}$	7 $\frac{1}{4}$	2	2	1	St	1	350	2117	19.3	400	14 $\frac{1}{8}$	No	Opt	Pins	Splines	Sc	No	2	57.00	
Brown-Lipe..... 12-SP	T, B, Tr	Var	SP	Wo	11 $\frac{1}{8}$	7 $\frac{1}{4}$	2	1	1	NI	1	Var	Var	Var	13 $\frac{1}{8}$	Sg	BT	Keys	Splines	Shs	No	2,3,4	38.00		
Brown-Lipe..... 13-SP	T, B, Tr	Var	SP	Wo	12 $\frac{1}{8}$	7 $\frac{1}{4}$	2	1	1	NI	1	Var	Var	Var	14 $\frac{1}{8}$	Sg	BT	Keys	Splines	Shs	No	1,2,3	45.00		
Brown-Lipe..... 14-SP	T, B, Tr	Var	SP	Wo	13 $\frac{1}{8}$	7 $\frac{1}{4}$	2	1	1	NI	2	Var	Var	Var	15 $\frac{1}{8}$	Sg	AB	Keys	Splines	Th	Y	1,2,3	58.00		
Brown-Lipe..... 13-2P	T, B, Tr	Var	DP	Wo	13	7 $\frac{1}{4}$	4	2	2	Var	Var	Var	Var	Var	15 $\frac{1}{2}$	No	AB	KP	Splines	Th	Y	1,2,3	84.00		
Brown-Lipe..... 14-2P	T, B, Tr	Var	DP	Wo	13 $\frac{1}{4}$	7 $\frac{1}{8}$	4	2	2	NI	2	Var	Var	Var	16 $\frac{1}{4}$	No	AB	KP	Splines	Th	Y	1,2	95.00		
Hele-Shaw(1)..... 5	T, B	210	MO	No	7	6	15	14	BS	1	250	250	62.0	250	10 $\frac{1}{2}$	No	AB	Pins	Pins	Th	Y	.....	58.00		
Hele-Shaw(1)..... 6	T, B	300	MO	No	9	7	12	11	BS	1	300	300	56.0	300	12 $\frac{1}{4}$	No	AB	Pins	Pins	Th	Y	.....	82.00		
Hele-Shaw(1)..... 7	T, B	370	MO	No	9	7	15	14	BS	1	300	300	56.0	300	12 $\frac{1}{4}$	No	AB	Pins	Pins	Th	Y	.....	86.00		
Hele-Shaw(1)..... 8	T, B	420	MO	No	11 $\frac{1}{2}$	9 $\frac{1}{2}$	12	11	BS	1	400	38.0	400	400	15 $\frac{1}{2}$	No	AB	Pins	Pins	Th	Y	.....	110.00		
Hele-Shaw(1)..... 10	T, B	575	MO	No	11 $\frac{1}{2}$	9 $\frac{1}{2}$	16	15	BS	1	400	38.0	400	400	15 $\frac{1}{2}$	No	AB	Pins	Pins	Th	Y	.....	150.00		
Hele-Shaw(1)..... 150	T, B	1000	MO	No	17	15	17	16	BS	1	600	54.0	600	21 $\frac{1}{2}$	No	AB	Pins	Pins	Th	Y	.....	300.00			
Lipe, W.C. .... Z34S	T, B, Tr	210	SP	W-M	11 $\frac{1}{8}$	7 $\frac{1}{4}$	2	1	1	SI	1	330	1750	25.0	390	13 $\frac{1}{8}$	Sg	BT	Lugs	Splines	Shs	No	3+	37.20	
Lipe, W.C. .... Z30S	T, B, Tr	270	SP	W-M	12 $\frac{1}{8}$	7 $\frac{1}{4}$	2	1	1	SI	1	360	2250	25.0	380	14 $\frac{1}{8}$	Sg	BT	Splines	Shs	No	3+	45.07		
Lipe, W.C. .... Z32S	T, B, Tr	340	SP	W-M	13 $\frac{1}{8}$	7 $\frac{1}{4}$	2	1	1	SI	1	410	2650	23.4	400	15 $\frac{1}{8}$	Sg	BT	Lugs	Splines	Shs	No	3+	57.00	
Lipe, W.C. .... Z31S	T, Tr	425	SP	Wo	13 $\frac{1}{8}$	7 $\frac{1}{4}$	2	1	1	SI	1	465	3230	29.4	515	15 $\frac{1}{2}$	Sg	BT	Lugs	Splines	Shs	No	3+	60.50	
Lipe, W.C. .... Z42S	T, Tr	450	SP	Wo	15	8	2	1	1	SI	1	485	3150	24.0	575	16 $\frac{1}{4}$	Sg	BT	Lugs	Splines	Shs	No	2+	73.00	
Lipe, W.C. .... Z40S	T, B, Tr	615	SP	Wo	15	8	2	1	1	SI	1	600	4200	33.0	725	16 $\frac{1}{4}$	Sg	BT	Lugs	Splines	Shs	No	2+	75.00	
Lipe, W.C. .... Z40S	T, Tr	600	DP	Wo	12 $\frac{1}{8}$	7 $\frac{1}{4}$	4	2	2	SI	1	485	2420	27.2	575	16 $\frac{1}{4}$	No	BT	Lugs	Splines	Shs	No	2+	83.00	
Lipe, W.C. .... Z38S	T, Tr	1000	DP	Wo	15	8	4	2	2	SI	1	485	3712	29.0	575	16 $\frac{1}{4}$	No	BT	Lugs	Splines	Shs	No	2+	105.00	
Long..... 7 $\frac{1}{2}$ -CB	Cars	60	SP	W-M	7 $\frac{1}{2}$	5	2	2	1	St	6	Var	Var	Var	8 $\frac{1}{2}$	Sg	BA	CS	Splines	No	No	3+	10.50		
Long..... 8 $\frac{1}{2}$ -CB	C.T	125	SP	W-M	8 $\frac{1}{2}$	6	2	2	1	St	6	Var	Var	Var	9 $\frac{1}{2}$	Sg	BA	CS	Splines	No	No	6+	10.75		
Long..... 9 $\frac{1}{2}$ -CF	C.T	(g)	SP	W-M	9	5 $\frac{1}{2}$	2	2	1	St	6	Var	Var	Var	11	Sg	BA	CS	Splines	No	No	5+	14.50		
Long..... 10 $\frac{1}{2}$ -CF	C.T, C.B, Tr	(h)	SP	W-M	9 $\frac{1}{2}$	6	2	2	1	St	6	Var	Var	Var	11 $\frac{1}{2}$	Sg	BA	CS	Splines	No	No	5+	15.75		
Long..... 10-CF	C.T, C.B, Tr	(d)	SP	W-M	10	6	2	2	1	St	6	Var	Var	Var	12	Sg	BA	CS	Splines	No	No	5+	20.50		
Long..... 11-CF	C.T, C.B, Tr	(e)	SP	W-M	11	6 $\frac{1}{2}$	2	2	1	St	9	Var	Var	Var	13	Sg	BA	CS	Splines	No	No	4+	23.75		
Long..... 12-CB	C.T, C.B, Tr	(f)	SP	W-M	12	7	2	2	1	St	12	Var	Var	Var	14 $\frac{1}{2}$	Sg	BA	CS	Splines	No	No	3+	37.75		
Long..... 29-A	T, Tr	225	DP	W-M	9 $\frac{1}{4}$	6 $\frac{1}{4}$	4	3	2	St	12	Var	Var	Var	14 $\frac{1}{4}$	No	AB	Lugs	Splines	Shs	No	No	4+	33.00	
Long..... 31-A	T, Tr	300	DP	W-M	11	6 $\frac{1}{2}$	4	3	2	St	12	Var	Var	Var	13	No	AB	Lugs	Splines	Shs	No	No	4+	44.00	
Long..... 34-BD	T, Tr	550	DP	W-M	13 $\frac{1}{8}$	7 $\frac{1}{4}$	4	3	2	St	18	Var	Var	Var	16 $\frac{1}{2}$	No	AB	Lugs	Splines	Shs	No	No	2+	99.25	
Long..... 13-6	T, B, Tr	350	SP	W-M	13 $\frac{1}{8}$	7 $\frac{1}{4}$	2	2	1	St	18	Var	Var	Var	15 $\frac{1}{8}$	Sg	BA	CS	Splines	Shs	No	No	2+	63.50	
Long..... 15-4	T, B, Tr	500	SP	W-M	15 $\frac{1}{2}$	9	2	2	1	St	18	Var	Var	Var	17 $\frac{1}{4}$	Sg	BA	CS	Splines	Shs	No	No	1+	75.50	
Long..... 17	T, B, Tr	600	SP	W-M	16 $\frac{1}{4}$	10	2	2	1	St	30	Var	Var	Var	19 $\frac{1}{8}$	No	BA	CS	Splines	Shs	No	No	1+	96.00	
Rockford..... 8-II	C.T	98	SP	W-M	7 $\frac{1}{2}$	5 $\frac{1}{2}$	2	1	1	St	6	720	720	27.6	213	9 $\frac{1}{2}$	Sg	Opt	Studs	Splines	SCL	No	No	4,5	.....
Rockford..... 9-II	T, B	145	SP	W-M	8 $\frac{1}{2}$	5 $\frac{1}{2}$	2	1	1	St	6	930	930	25.9	221	10 $\frac{1}{2}$	Sg	Opt	Studs	Splines	SCL	No	No	2,3,4,5	.....
Rockford..... 12-II	T, B, Tr	347	SP	W-M	11 $\frac{1}{8}$	6 $\frac{1}{2}$	2	1	1	St	9	1665	1665	22.6	420	13 $\frac{1}{8}$	Sg	Opt	Studs	Splines	SCL	No	No	2,3,4	.....
Rockford..... 14-II	T, B, Tr	590	SP	W-M	13 $\frac{1}{8}$	8	2	1	1	St	12	2460	2460	24.3	575	15 $\frac{1}{8}$	No	Opt	Studs	Splines	SCL	No	No	1,2,3	.....
Rockford..... 9-IT	T, B	210	SP	W-M	9	5 $\frac{1}{2}$	2	1	1	St	12	1350	1350	36.0	295	11 $\frac{1}{8}$	No	Opt	L.O.P.	Splines	SCL	No	No	2,3,4,5	.....
Rockford..... 10-IT	C.T, B, Tr	225	SP	W-M	9 $\frac{1}{2}$	6 $\frac{1}{2}$	2	1	1	St	12	1500	1500	32.0	350	12	No	Opt	L.O.P.	Splines	SCL	No	No	2,3,4,5	.....
Rockford..... 11-IT	C.T, B, Tr	320	SP	W-M	10 $\frac{1}{2}$	6 $\frac{1}{2}$	2	1	1	St	12	1740	1740	31.8	435	13	Sg	Opt	L.O.P.	Splines	SCL	No	No	2,3,4	.....
Rockford..... 12-IT	T, B, Tr	540	SP	W-M	11 $\frac{1}{2}$	6 $\frac{1}{2}$	2	1	1	St	15	2175	2175	30.5	435	14 $\frac{1}{2}$	Sg	Opt	L.O.P.	Splines	SCL	No	No	2,3,4	.....
Rockford..... 14-IT	T, B, Tr	63																							

## AMERICAN STOCK, MARINE AND

Line Number	MAKE AND MODEL	Designed for	Number of Cylinders Bore and Stroke (In.)	Rated Hp. (A.M.A.)	Maximum Brake Hp. at Specified R.P.M.	Piston Displacement (Cu. In.)	Compression Ratio	Maximum Torque at R.P.M. (Lb. Ft.)	No. of Cylinders Cast In One Piece Crankcase—Upper Half Integral with Cylinders	Arrangement	VALVES												
											Max. Head Diameter (In.)	Min. Port Diameter (In.)	Lift (In.)	Stem Diameter (In.)	Seat Angle (Degrees)								
Intake		Exhaust		Intake		Exhaust		Intake		Exhaust		Intake		Exhaust									
1	Allis-Chalmers.	B-15	Tr. PU	4-3 $\frac{1}{4}$ x 3 $\frac{1}{2}$	16.9	22-1800	116.0	5.00	74-1100	W	In	—	Sil	1.43	1.31	1.18	1.00	.372	.372	.341	.341	45	
2	Allis-Chalmers.	W-25	Tr. PU	4-4x4	25.6	31-1300	201.0	5.00	130-1150	W	In	—	Sil	1.68	1.50	1.50	1.31	.372	.372	.372	.372	45	
3	Allis-Chalmers.	U-40	Tr. PU	4-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	32.4	45-1200	318.0	4.75	200-900	W	In	—	Sil	2.03	1.78	1.75	1.50	.375	.375	.373	.373	30	
4	Allis-Chalmers.	E-60	Tr. PU	4-5 $\frac{1}{2}$ x 6 $\frac{1}{2}$	44.1	68-1050	563.0	4.50	370-750	W	Se	—	Sil	2.21	2.21	2.00	2.00	.437	.415	.434	.434	45	
5	Allis-Chalmers.	L-90	Tr. PU	6-5 $\frac{1}{2}$ x 6 $\frac{1}{2}$	66.1	102-1050	844.0	4.50	550-725	W	Se	—	Sil	2.21	2.21	2.00	2.00	.437	.415	.434	.434	45	
6	Autocar	315	T	6-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	33.7	81-2400	315.0	5.50	220-800	6	Se	—	Sil	1.75	1.65	1.56	1.43	.372	.372	.347	.347	45	
7	Autocar	358	T	6-4x4 $\frac{1}{2}$	38.4	89-2400	358.0	4.50	248-900	5	Se	—	Sil	1.90	1.78	1.68	1.55	.372	.375	.375	.375	45	
8	Autocar	408	T	6-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	39.6	110-2400	408.0	5.50	293-900	6	Se	—	Sil	2.06	1.93	1.87	1.75	.375	.375	.375	.375	45	
9	Autocar	447	T	6-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	43.4	116-2400	447.0	5.50	331-800	6	Se	—	Sil	2.06	1.93	1.87	1.87	.375	.375	.375	.375	45	
10	Autocar	501	T	6-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	48.6	124-2300	501.0	5.50	380-800	6	Se	—	Sil	2.06	2.06	1.87	1.75	.375	.375	.375	.375	45	
11	Brennan	Imp. C. T. Tr	4-2-2x3	7.8	20-3800	45.6	5.00	34-1800	4	Se	—	Sil	1.00	1.00	—	—	.250	.250	.312	.312	30		
12	Brennan	Imp. M	4-2-2x3	—	20-3800	45.6	7.00	34-1800	4	Se	—	Sil	1.00	1.00	.875	.875	.250	.250	.312	.312	30		
13	Brennan	M	4-4x5	—	40-2000	251.0	5.00	160-1000	4	Se	—	Ci	2.00	2.00	1.87	1.87	.375	.375	.375	.375	45		
14	Brennan	E4	M	4-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	50-1500	318.0	5.00	203-1000	4	Se	—	Sil	2.03	2.00	1.87	1.87	.375	.375	.375	.375	45		
15	Brennan	CE	T. Tr	4-4 $\frac{1}{2}$ x 5	32.4	55-1800	318.0	4.06	225-1000	4	Se	—	Sil	2.00	2.00	—	—	.375	.375	.375	.375	45	
16	Brennan	B70	T. B. Tr	6-4x5 $\frac{1}{2}$	38.4	70-1800	414.7	4.50	250-800	3	Se	—	Sil	2.12	2.12	—	—	.375	.375	.437	.437	45	
17	Brennan	90	M	6-4x5 $\frac{1}{2}$	100-2200	414.7	6.00	270-900	3	Se	—	Sil	2.12	2.12	2.00	2.00	.375	.375	.437	.437	45		
18	Brennan	125	M	6-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	125-2000	496.0	6.00	325-1000	3	Se	—	Sil	2.12	2.12	2.00	2.00	.375	.375	.437	.437	45		
19	Brennan	100	T. B. Tr	6-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	45.9	75-1800	496.0	4.50	320-800	3	Se	—	Sil	2.50	2.50	—	—	.375	.375	.437	.437	45	
20	Brennan	150	M	6-4 $\frac{1}{2}$ x 6 $\frac{1}{2}$	150-2000	620.3	5.00	510-1400	3	Se	—	Sil	2.50	2.50	—	—	.437	.437	.500	.500	45		
21	Brennan	150	T. B. Tr	6-4 $\frac{1}{2}$ x 6 $\frac{1}{2}$	48.6	150-2000	620.3	5.00	510-1400	3	Se	—	Sil	2.50	2.50	—	—	.437	.437	.500	.500	45	
22	Bridgeport	F-5	M	1-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	6-1200	49.0	—	—	1	In	—	NS	1.43	1.43	—	—	—	—	—	—	—		
23	Bridgeport	F-10	M	2-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	12-1200	99.0	—	—	2	In	—	NS	1.43	1.43	—	—	—	—	—	—	—		
24	Bridgeport	F-20	M	4-2 $\frac{1}{2}$ x 4	25-2500	95.0	—	—	4	In	—	CNS	1.12	1.12	—	—	—	—	—	—	45		
25	Bridgeport	F-25	M	4-3 $\frac{1}{2}$ x 3 $\frac{1}{2}$	50-2500	134.0	—	—	4	In	—	CNS	1.37	1.25	—	—	.312	.312	—	—	45		
26	Bridgeport	400	Pilot M	4-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	55-2000	283.0	—	—	4	In	—	NS	1.62	1.62	—	—	—	—	—	—	45		
27	Bridgeport	400	Pilot M	6-4 $\frac{1}{2}$ x 4 $\frac{1}{2}$	80-2000	428.0	—	—	6	In	—	Sil	1.75	1.75	—	—	—	—	—	—	45		
28	Buda	HP-205	T. Tr	4-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	23.2	51-2400	205.0	4.75	132-1200	4	Se	—	Sil	2.112	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45
29	Buda	HP-217	T. Tr	4-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	23.2	54-2400	217.0	5.00	146-1200	4	Se	—	Sil	2.112	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45
30	Buda	HM-217	M	4-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	54-2400	217.0	5.00	146-1200	4	Se	—	Sil	2.112	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45	
31	Buda	HM-217-R	M	4-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	54-2400	217.0	5.00	146-1200	4	Se	—	Sil	2.112	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45	
32	Buda	KT-281	Tr.	4-4 $\frac{1}{2}$ x 5 $\frac{1}{2}$	27.2	49-1750	281.0	4.50	173-1000	4	Se	—	Sil	1.87	1.87	1.62	1.62	.312	.312	.372	.372	45	
33	Buda	YT-381	T. B. Tr	4-4 $\frac{1}{2}$ x 6	32.4	50-1400	381.7	4.10	222-850	4	Se	—	Sil	2.112	2.37	2.37	2.12	2.12	.291	.312	.372	.372	45
34	Buda	YR-425	T	4-4 $\frac{1}{2}$ x 6	36.0	57-1400	425.3	3.80	264-700	4	Se	—	Sil	2.112	2.37	2.37	2.12	2.12	.281	.312	.372	.372	45
35	Buda	BTU	T. B. Tr	4-5 $\frac{1}{2}$ x 6 $\frac{1}{2}$	40.0	61-1200	510.5	4.65	330-650	4	Se	—	Sil	2.112	2.50	2.50	2.25	2.25	.375	.375	.434	.434	45
36	Buda	FR	T. B. Tr	4-5 $\frac{1}{2}$ x 6 $\frac{1}{2}$	48.5	78-1200	618.0	4.60	405-650	4	Se	—	Sil	2.112	2.50	2.50	2.25	2.25	.375	.375	.434	.434	45
37	Buda	JV-4	Tr. Ind	4-5 $\frac{1}{2}$ x 7 $\frac{1}{2}$	52.9	85-1200	740.0	4.75	385-725	2	Se	—	Sil	2.75	2.75	2.50	2.50	.375	.375	.497	.497	45	
38	Buda	JK-4	Tr. Ind	6-6 $\frac{1}{2}$ x 7 $\frac{1}{2}$	57.6	115-1200	806.0	4.70	560-700	2	Se	—	Sil	2.12	2.93	2.93	2.50	2.50	.375	.375	.497	.497	30
39	Buda	JL-877	Tr. Ind	4-6 $\frac{1}{2}$ x 7 $\frac{1}{2}$	62.5	108-1000	874.0	4.60	645-650	2	Se	—	Sil	2.12	2.93	2.93	2.50	2.50	.375	.375	.497	.497	30
40	Buda	HP-260	T. B.	6-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	29.4	68-2800	260.0	4.75	165-1200	6	In	—	Sil	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45	
41	Buda	HM-260	M	6-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	—	70-2800	260.0	5.25	183-1000	6	In	—	Sil	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45	
42	Buda	HM-260-R	M	6-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	—	70-2800	260.0	5.25	183-1000	6	In	—	Sil	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45	
43	Buda	HP-298	T. B. Tr	6-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	33.7	77-2800	290.0	4.75	190-1100	6	In	—	Sil	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45	
44	Buda	HP-326	T. B. Tr	6-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	34.8	78-2400	320.0	5.35	218-1000	6	In	—	Sil	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45	
45	Buda	HM-326-R	M	6-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	—	78-2400	326.0	5.35	218-1000	6	In	—	Sil	1.65	1.53	1.50	1.37	.344	.344	.372	.372	45	
46	Buda	K-359	T. B.	6-4 $\frac{1}{2}$ x 4 $\frac{1}{2}$	39.6	99-2800	369.0	4.73	234-1100	6	In	—	Sil	1.90	1.78	1.75	1.62	.400	.400	.372	.372	45	
47	Buda	K-393	T. B. Tr</																				

# COMMERCIAL VEHICLE ENGINES

Front End Drive - Type	PISTONS				CONNECTING RODS				CRANKSHAFT				SPARK PLUG	CARBU-RETOR	OVERALL DIMENSIONS (In.)			Line Number							
	Material	Length (In.)	Weight (with Pins, Rings and Bushing) - (Oz.)	Piston Pin - Diameter and Length (In.)					Main Bearings						Width	Height	Length								
					Number of Rings per Piston	Material	Center to Center Length (In.)	Weight - With Bushing and Cap (Oz.)	Material	Counterbalances Used	Crank-pin Number	Diameter and Length (In.)	Front	Rear	Oil Pressure T <sub>0</sub>	Thread Size	Size								
HG	CI	3.68	40.0	.813x2.87	3	CS	6 <sup>1/2</sup>	32	CS	N	1.93x1.25	3	2.25x1.50	2.25x1.50	aceg	CA	14 mm.	Zen	1 <sup>3/4</sup>	K-D	360	16 <sup>3/4</sup>	23 <sup>1/2</sup>	26 <sup>1/2</sup>	1
HG	CI	4.43	61.0	.989x3.50	4	CS	7 <sup>1/2</sup>	42	CS	N	2.35x1.54	3	2.41x1.59	2.46x1.75	abceg	CA	14 mm.	Zen	1 <sup>1/2</sup>	K-D(5)	425	19 <sup>1/2</sup>	31 <sup>1/2</sup>	33 <sup>1/2</sup>	2
HG	CI	5.25	80.0	1.31x4.06	4	CS	9 <sup>1/2</sup>	92	CS	N	2.37x1.37	3	2.50x2.31	2.50x2.74	abdeg	CA	7 <sup>1/2</sup> -18	Zen	1 <sup>1/2</sup>	K-D(5)	980	26 <sup>1/2</sup>	36 <sup>1/2</sup>	43 <sup>3/4</sup>	3
HG	CI	6.75	158.0	1.50x4.87	4	CS	13	176	CS	N	2.75x3.25	3	3.00x3.50	3.00x4.74	abdeg	CA	7 <sup>1/2</sup> -18	Zen	1 <sup>1/2</sup>	K-D(5)	1830	27	44 <sup>1/2</sup>	57 <sup>1/2</sup>	4
HG	CI	6.75	158.0	1.50x4.87	4	CS	13	176	CS	N	2.75x1.44	4	3.00x3.50	3.00x4.74	abdeg	CA	7 <sup>1/2</sup> -18	Zen	1 <sup>1/2</sup>	K-D(5)	2870	29	51 <sup>1/2</sup>	72 <sup>1/2</sup>	5
HG	Ala	4.87	36.0	1.12x3.18	4	AS	10 <sup>1/4</sup>	73	CS	CS	2.25x1.44	7	3.00x1.87	3.00x2.62	abdeg	CH	18 mm.	Zen	1 <sup>1/2</sup>	No	1155	27 <sup>1/2</sup>	30 <sup>1/2</sup>	42 <sup>1/2</sup>	6
HG	Ala	4.87	43.0	1.12x3.43	4	AS	10 <sup>1/4</sup>	73	CS	CS	2.50x1.58	7	3.25x2.45	3.25x2.87	abdeg	CH	18 mm.	Zen	1 <sup>1/2</sup>	No	1165	27 <sup>1/2</sup>	30 <sup>1/2</sup>	42 <sup>1/2</sup>	7
HG	Ala	5.75	45.0	1.12x3.43	4	AS	10 <sup>1/4</sup>	88	CS	CS	2.50x1.58	7	3.25x1.87	3.25x2.87	abdeg	CH	18 mm.	Zen	1 <sup>1/2</sup>	No	1355	27 <sup>1/2</sup>	31 <sup>1/2</sup>	45 <sup>1/2</sup>	8
HG	Ala	5.75	51.0	1.12x3.68	4	AS	10 <sup>1/4</sup>	88	CS	CS	2.50x1.58	7	3.25x1.87	3.25x2.87	abdeg	CH	18 mm.	Zen	1 <sup>1/2</sup>	No	1360	27 <sup>1/2</sup>	31 <sup>1/2</sup>	45 <sup>1/2</sup>	9
HG	Ala	5.75	57.0	1.12x3.93	4	AS	10 <sup>1/4</sup>	88	CS	CS	2.50x1.58	7	3.25x1.87	3.25x2.87	abdeg	CA	18 mm.	Str	1 <sup>3/4</sup>	No	1360	27 <sup>1/2</sup>	31 <sup>1/2</sup>	45 <sup>1/2</sup>	10
HG	Al	2.62	62.5x2.00	3	AS	7	.....	.....	CNS	Y	1.37x1.25	2	ball	roller	abdeg	CA	Til	1 <sup>3/4</sup>	No	130	13 <sup>1/2</sup>	18	20	11	
HG	Al	2.62	62.5x2.00	3	AS	7	.....	.....	CNS	Y	1.37x1.25	2	ball	roller	abdeg	CH	TZ	1 <sup>3/4</sup>	No	160	8 <sup>3/4</sup>	12	29	12	
SG	CI	5.00	1.17x4.00	4	AS	11	.....	.....	CNS	N	2.50x2.00	3	2.12x4.25	2.12x2.25	abdeg	CA	Str	1 <sup>1/2</sup>	K-D	650	12 <sup>1/2</sup>	19 <sup>1/2</sup>	53 <sup>1/2</sup>	13	
HG	SS	5.00	72.0	1.17x4.00	5	AS	11	64	NS	N	2.50x2.50	3	2.50x4.25	2.50x3.50	abdeg	CA	Str	1 <sup>1/2</sup>	K-D	950	16	18	53	14	
SG	SS	5.00	72.0	1.17x4.00	5	AS	11	64	NS	N	2.50x2.50	3	2.50x4.50	2.50x3.50	abdeg	CA	Str	1 <sup>1/2</sup>	K-D	650	21	29 <sup>3/4</sup>	37 <sup>1/2</sup>	15	
HG	SS	4.50	64.0	1.17x3.87	4	CS	.....	.....	CNS	Y	2.50x2.00	3	2.75x4.50	2.75x3.00	abdeg	CA	Str	1 <sup>1/2</sup>	K-D	800	25 <sup>1/2</sup>	33 <sup>1/2</sup>	49 <sup>1/2</sup>	16	
HG	SS	4.50	64.0	1.17x3.87	4	CS	.....	.....	CNS	Y	2.50x2.00	3	2.75x4.50	2.75x3.00	abdeg	CA	Str	1 <sup>1/2</sup>	K-D	750	19 <sup>1/2</sup>	24 <sup>1/2</sup>	65	17	
HG	SS	4.50	76.0	1.25x3.87	5	AS	11	.....	CNS	Y	2.50x2.00	3	2.75x4.50	2.75x3.00	abdeg	CA	Str	1 <sup>1/2</sup>	K-D	900	19 <sup>1/2</sup>	24 <sup>1/2</sup>	65	18	
HG	SS	4.50	76.0	1.25x3.87	5	AS	11	.....	CNS	Y	2.50x2.00	3	2.75x4.50	2.75x3.00	abdeg	CA	Str	1 <sup>1/2</sup>	K-D	875	25 <sup>1/2</sup>	33	49 <sup>1/2</sup>	19	
BG	SS	5.00	72.0	1.37x4.00	5	AS	12	80	CNS	N	2.62x2.62	7	2.62x5.00	2.62x3.50	abdeg	CA	Str	1 <sup>3/4</sup>	K-D	1450	20	30	74	20	
BG	SS	5.00	72.0	1.37x4.00	5	AS	12	80	CNS	N	2.62x2.62	7	2.62x5.00	2.62x3.50	abdeg	CA	Str	1 <sup>3/4</sup>	K-D	1000	22	40	54	21	
SG	CI	4.00	58.0	0.750x3.62	3	CS	9	60	CS	Y	1.37x2.00	2	1.50x3.00	1.50x3.00	abdeg	CA	Str	1 <sup>3/4</sup>	No	155	14	22 <sup>1/2</sup>	21	22	
SG	CI	4.00	58.0	0.750x3.62	3	CS	9	60	CNS	Y	1.37x2.00	2	1.50x3.00	1.50x3.00	abdeg	CA	Str	1 <sup>3/4</sup>	No	397	17	22	35	23	
HG	CI	3.25	41.0	0.825x2.62	3	CS	9	47	CS	N	1.50x1.75	7	2.75x1.50	2.75x1.50	abdeg	CA	Str	1 <sup>3/4</sup>	No	590	26	29 <sup>1/2</sup>	31 <sup>1/2</sup>	28	
HG	CI	3.50	50.0	0.750x3.18	3	CS	9	47	CS	N	1.75x1.50	7	3.00x2.50	3.00x2.50	abdeg	CA	Str	1 <sup>3/4</sup>	No	950	20	28	53	26	
HG	CI	4.00	59.0	0.874x4.12	3	CS	9 <sup>1/2</sup>	60	CNS	Y	2.00x2.25	3	2.00x4.12	2.00x4.12	abdeg	CA	Str	1 <sup>3/4</sup>	No	1650	18	31	62	27	
HG	CI	4.00	61.0	1.25x4.25	3	CS	9 <sup>1/2</sup>	60	CNS	Y	2.00x2.25	3	2.00x4.12	2.00x4.12	abdeg	CA	Str	1 <sup>3/4</sup>	No	590	26	29 <sup>1/2</sup>	31 <sup>1/2</sup>	28	
HG	CI	4.00	61.0	1.25x4.25	3	CS	9 <sup>1/2</sup>	60	CNS	N	2.00x2.25	3	2.00x4.12	2.00x4.12	abdeg	CA	Str	1 <sup>3/4</sup>	No	1087	25 <sup>1/2</sup>	36 <sup>1/2</sup>	47 <sup>1/2</sup>	33	
HG	CI	3.75	42.0	1.12x3.22	4	CS	9 <sup>1/2</sup>	42	CS	N	2.12x1.62	5	3.00x1.50	3.00x2.12	abdeg	AC	Str	1 <sup>3/4</sup>	No	1087	25 <sup>1/2</sup>	36 <sup>1/2</sup>	47 <sup>1/2</sup>	34	
HG	CI	3.75	42.0	1.12x3.22	4	CS	9 <sup>1/2</sup>	42	CS	N	2.12x1.62	5	3.00x1.50	3.00x2.12	abdeg	AC	Str	1 <sup>3/4</sup>	No	1409	28 <sup>1/2</sup>	40 <sup>1/2</sup>	52 <sup>1/2</sup>	35	
HG	CI	3.75	42.0	1.12x3.22	4	CS	9 <sup>1/2</sup>	42	CS	N	2.12x1.62	5	3.00x1.50	3.00x2.12	abdeg	AC	Str	1 <sup>3/4</sup>	No	1430	28 <sup>1/2</sup>	40 <sup>1/2</sup>	52 <sup>1/2</sup>	36	
HG	CI	3.75	42.0	1.12x3.22	4	CS	9 <sup>1/2</sup>	42	CS	N	2.12x1.62	5	3.00x1.50	3.00x2.12	abdeg	AC	Str	1 <sup>3/4</sup>	No	1925	30	47	58 <sup>1/2</sup>	37	
HG	CI	5.00	65.0	1.50x3.31	4	CS	11 <sup>1/4</sup>	89	CS	N	2.03x2.25	3	1.87x2.87	2.12x3.44	abdeg	AC	Str	1 <sup>3/4</sup>	No	875	25 <sup>1/2</sup>	33 <sup>1/2</sup>	40 <sup>1/2</sup>	39	
HG	CI	6.25	97.0	1.25x2.87	4	CS	13 <sup>1/4</sup>	122	CS	N	2.25x3.00	3	2.12x3.44	2.37x4.44	abdeg	AC	Str	1 <sup>3/4</sup>	No	1087	25 <sup>1/2</sup>	36 <sup>1/2</sup>	47 <sup>1/2</sup>	33	
HG	CI	6.12	111.0	1.43x4.11	4	AS	13 <sup>1/4</sup>	106	CS	N	2.50x2.87	3	2.50x3.00	2.50x4.50	abdeg	AC	Str	1 <sup>3/4</sup>	No	1087	25 <sup>1/2</sup>	36 <sup>1/2</sup>	47 <sup>1/2</sup>	34	
HG	CI	6.75	142.0	1.37x4.37	4	AS	14 <sup>1/2</sup>	163	CS	N	2.50x3.12	3	2.25x4.12	2.62x4.69	abdeg	AC	Str	1 <sup>3/4</sup>	No	1409	28 <sup>1/2</sup>	40 <sup>1/2</sup>	52 <sup>1/2</sup>	35	
HG	CI	6.75	144.0	1.37x4.87	4	AS	14 <sup>1/2</sup>	163	CS	N	2.50x3.12	3	2.25x4.12	2.62x4.69	abdeg	AC	Str	1 <sup>3/4</sup>	No	1430	28 <sup>1/2</sup>	40 <sup>1/2</sup>	52 <sup>1/2</sup>	36	
HG	CI	6.87	172.0	2.00x4.87	4	AS	14 <sup>1/2</sup>	227	CS	N	3.00x3.31	3	3.00x4.75	3.00x4.75	abdeg	AC	Str	1 <sup>3/4</sup>	No	1925	30	40	58 <sup>1/2</sup>	39	
HG	CI	3.75	37.0	1.12x2.97	4	CS	9 <sup>1/2</sup>	42	CS	N	2.12x1.62	7	3.00x1.50	3.00x2.12	abdeg	AC	Str	1 <sup>3/4</sup>	No	900	25 <sup>1/2</sup>	39 <sup>1/2</sup>	47 <sup>1/2</sup>	47	
HG	CI	3.75	37.0	1.12x2.97	4	CS	9 <sup>1/2</sup>	42	CS	N	2.12x1.62	7	3.00x1.50	3.00x2.12	abdeg	AC	Str	1 <sup>3/4</sup>	No	905	25 <sup>1/2</sup>	39 <sup>1/2</sup>	47 <sup>1/2</sup>	48	
HG	CI	4.37	50.0	1.25x3.47	4	CS	9 <sup>1/2</sup>	58	CS	N	2.37x1.75	7	3.00x1.75	3.00x2.50	abdeg	AC	Str	1 <sup>3/4</sup>	No	905	25 <sup>1/2</sup>	39 <sup>1/2</sup>	47 <sup>1/2</sup>	49	
HG	CI	4.37	63.0	1.25x3.47	4	CS	9 <sup>1/2</sup>	58	CS	N															

## AMERICAN STOCK, MARINE AND

Line Number	MAKE AND MODEL	Designed for	Number of Cylinders Bore and Stroke (In.)	Rated Hp. (A.M.A.)	Maximum Brake Hp. at Specified R.P.M.	Piston Displacement (Cu. In.)	Compression Ratio	Maximum Torque at R.P.M. (Lb. Ft.)	No. of Cylinders Cast In One Piece	Crankcase—Upper Half Integral with Cylinders	VALVES											
											Exhaust Head Material or S.A.E. No.	Max. Head Diameter (In.)	Min. Port Diameter (In.)	Lift (In.)	Stem Diameter (In.)	Seat Angle (Degrees)						
Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust							
1	Continental	Y-4091	C, T, Tr, Ind	4-2 <sup>7</sup> <sub>16</sub> x 3 <sup>1</sup> <sub>2</sub>	13.2	36-3300	90.9	6.00	66-1300	4	In	XCR	1.20	1.01	1.06	.875	.291	.292	.314	.312	(h)	
2	Continental	F-4124	C, T, Tr, Ind	4-3 <sup>1</sup> <sub>2</sub> x 3 <sup>1</sup> <sub>2</sub>	14.4	47.5-3300	123.7	6.00	94-1600	4	In	XCR	1.51	1.32	1.37	1.18	.281	.280	.341	.339	(h)	
3	Continental	F-4140	C, T, Tr, Ind	4-3 <sup>1</sup> <sub>2</sub> x 3 <sup>1</sup> <sub>2</sub>	16.3	52-3250	139.6	6.00	108-1600	4	In	XCR	1.51	1.32	1.37	1.18	.281	.280	.341	.339	(h)	
4	Continental	F-4162	C, T, Tr, Ind	4-3 <sup>1</sup> <sub>2</sub> x 3 <sup>1</sup> <sub>2</sub>	18.9	58.5-3300	162.4	5.76	122-1600	4	In	XCR	1.51	1.32	1.37	1.18	.281	.280	.341	.339	(h)	
5	Continental	OS-6202	T, Tr, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	23.4	70-3200	201.3	6.46	152-1200	6(1)	In	Sil	1.54	1.20	1.37	1.05	.390	.390	.373	.371	(h)	
6	Continental	F-6170	C, T, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4	21.6	65-3500	169.6	6.60	124-1200	6	In	XCR	1.51	1.32	1.37	1.18	.284	.284	.341	.339	(h)	
7	Continental	F-6199	C, T, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	25.4	68.5-3400	199.1	6.00	150-1200	6	In	XCR	1.51	1.32	1.37	1.18	.284	.284	.341	.339	(h)	
8	Continental	F-6209	C, T, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	24.4	71-3100	209.5	5.75	154-1200	6	In	XCR	1.51	1.32	1.37	1.18	.284	.284	.341	.339	(h)	
9	Continental	F-6218	C, T, Tr, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	25.4	73.5-3100	217.8	5.75	161-1250	6	In	XCR	1.51	1.32	1.37	1.18	.284	.284	.341	.339	(h)	
10	Continental	A-6244	C, T, B, Tr, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	28.3	83.5-3000	243.6	5.40	178-1200	6	In	XCR	1.57	1.42	1.43	1.31	.311	.311	.339	.338	(h)	
11	Continental	M-6271	T, B, Tr, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	31.5	85-2800	270.9	5.70	190-1200	6	In	XCR	1.76	1.51	1.62	1.37	.354	.354	.404	.402	(h)	
12	Continental	M-6290	T, B, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	33.7	88-2750	289.9	5.70	205-1200	6	In	XCR	1.76	1.51	1.62	1.37	.354	.354	.404	.402	(h)	
13	Continental	M-6330	T, B, Ind	6-4 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	38.4	95.5-2750	329.9	5.50	233-1200	6	In	XCR	1.76	1.51	1.62	1.37	.354	.354	.404	.402	(h)	
14	Continental	E-600	T, B, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	32.6	78-2650	288.3	5.43	192-900	6	In	XCR	2.06	1.87	1.81	1.62	.406	.378	.434	.432	30	
15	Continental	E-601	T, B, Ind	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	36.0	86-2800	318.4	5.48	214-900	6	In	XCR	2.06	1.87	1.81	1.62	.406	.378	.434	.432	30	
16	Continental	E-602	T, B, Ind	6-4 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	40.8	95.5-2550	360.8	5.40	252-900	6	In	XCR	2.06	1.87	1.81	1.62	.406	.378	.434	.432	30	
17	Continental	E-603	T, B, Ind	6-4 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	43.3	98-2400	380.3	5.43	265-1000	6	In	XCR	2.06	1.87	1.81	1.62	.406	.378	.434	.432	30	
18	Continental	20R	T, B, Ind	6-4 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	40.8	106-2600	380.9	4.75	276-1200	6	In	AUS	2.06	1.87	1.81	1.62	.406	.378	.434	.432	30	
19	Continental	21R	T, B, Ind	6-4 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	45.9	118-2550	428.4	5.63	308-1200	6	In	AUS	2.06	1.87	1.81	1.62	.406	.378	.434	.432	30	
20	Continental	22R	T, B, Ind	6-4 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	48.6	138-2400	501.0	4.50	364-1100	6	In	AUS	2.06	1.87	1.81	1.62	.406	.378	.434	.432	30	
21	Dodge	TD	T	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	25.3	77-3000	217.7	5.60	158-1200	6	In	Sil	1.46	1.46	1.51	1.31	.312	.312	.340	.345		
22	Dodge	TE	T	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	27.3	73-3000	218.0	5.80	150-1200	6	In	Sil	1.65	1.53	1.50	1.37	.343	.343	.340	.345		
23	Dodge	TF	T	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	27.3	78-3000	228.1	5.80	158-1200	6	In	Tun	1.65	1.53	1.50	1.37	.343	.343	.340	.345		
24	Dodge	TG-TK	T	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	33.7	100-2800	331.3	5.20	230-800	6	In	Tun	1.93	1.75	1.78	1.59	.312	.312	.371	.371	45	
25	Dodge	F-42	M	4-5x6	.....	90-1600	471.0	5.00	325-1050	2	Se	Sil	2.50	2.50	2.25	2.25	.303	.305	.437	.437	45	
26	Elco	F-62	M	6-5x6	.....	145-1600	707.0	5.00	490-1050	2	Se	Sil	2.50	2.50	2.25	2.25	.303	.305	.437	.437	45	
27	Elco	Go Best LN-403	M	4-3x4	.....	20-1800	113.0	.....	.....	4	In	CNS	1.28	1.28	1.28	1.28	.....	.....	251	251	279	45
28	Fay & Bowen	LC-41	M	4-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	27-1600	173.0	.....	.....	4	In	CNS	1.53	1.53	1.53	1.53	.....	.....	292	292	311	311	
29	Fay & Bowen	Rocket	M	4-2 <sup>1</sup> <sub>2</sub> x 3 <sup>1</sup> <sub>2</sub>	35-3200	90.0	.....	.....	4	Se	CNS	1.53	1.53	1.53	1.53	.....	.....	.....	.....	.....	.....	
30	Fay & Bowen	LN-43	M	4-4 <sup>1</sup> <sub>2</sub> x 5 <sup>1</sup> <sub>2</sub>	40-1000	389.8	.....	.....	4	Se	CNS	1.53	1.53	1.53	1.53	.....	.....	.....	.....	.....	.....	
31	Fay & Bowen	LC-61	M	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	55-2000	257.7	.....	.....	6	In	CNS	1.53	1.53	1.53	1.53	.....	.....	375	375	375	30	
32	Fay & Bowen	LNS-43	M	4-4 <sup>1</sup> <sub>2</sub> x 5 <sup>1</sup> <sub>2</sub>	60-1400	398.8	.....	.....	4	Se	CNS	1.53	1.53	1.53	1.53	.....	.....	375	375	375	30	
33	Fay & Bowen	Challenger	M	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	60-2800	215.0	.....	.....	6	In	CNS	1.53	1.53	1.53	1.53	.....	.....	375	375	375	30	
34	Fay & Bowen	B	M	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	70-2200	331.5	.....	.....	6	In	CNS	1.53	1.53	1.53	1.53	.....	.....	375	375	375	30	
35	Fay & Bowen	Conqueror	M	6-4 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	100-2100	453.0	.....	.....	3	Se	CNS	1.53	1.53	1.53	1.53	.....	.....	375	375	375	30	
36	Ford	6CHP	C, T	8-2.60x3.20	21.6	60-3500	136.0	6.60	94-2500	8	In	CNS	1.28	1.28	1.28	1.28	.....	.....	251	251	279	45
37	Ford	85HP	C, T, B	8-3.06x3.75	30.0	85-3800	221.0	1.50	200-1500	8	In	CNS	1.53	1.53	1.53	1.53	.....	.....	292	292	311	311
38	Ford	95HP	C, T	8-3.18x3.75	32.5	95-3600	239.0	6.15	170-2100	8	In	CNS	1.53	1.53	1.53	1.53	.....	.....	311	311	311	45
39	Ford	GAH-377	T, B, Tr, Ind	6-4x5	38.4	104-2500	377.0	4.90	250-1500	1	Se	CNS	1.75	1.43	1.62	1.31	375	375	375	375	375	30
40	Franklin	GA-377	T, B, Tr, Ind	6-4x5	38.4	104-2500	377.0	4.90	250-1500	1	Se	CNS	1.75	1.43	1.62	1.31	375	375	375	375	375	30
41	Franklin	GAH-400	T, B, Tr, Ind	6-4 <sup>1</sup> <sub>2</sub> x 5	40.8	110-2500	400.0	5.00	268-1500	1	Se	CNS	1.75	1.43	1.62	1.31	375	375	375	375	375	30
42	Franklin	GA-400	T, B, Tr, Ind	6-4 <sup>1</sup> <sub>2</sub> x 5	40.8	110-2500	400.0	5.00	268-1500	1	Se	CNS	1.75	1.43	1.62	1.31	375	375	375	375	375	30
43	Franklin	4CHO-150	T, Tr	4-3 <sup>1</sup> <sub>2</sub> x 3 <sup>1</sup> <sub>2</sub>	43.0	150-2000	51.0	5.00	100-1200	1	Se	CNS	1.68	1.46	1.50	1.40	375	375	375	375	375	30
44	G. M. C.	228	T	6-3 <sup>1</sup> <sub>2</sub> x 3 <sup>1</sup> <sub>2</sub>	30.4	78-3000	228.0	6.15	178-1000	6	In	Sil	1.64	1.46	1.25	1.15	289	307	343	343	30	
45	G. M. C.	248	T	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	31.5	89-3000	248.5	6.15	195-1100	6	In	Sil	1.64	1.46	1.25	1.15	289	307	343	343	30	
46	G. M. C.	278	T	6-3 <sup>1</sup> <sub>2</sub> x 4 <sup>1</sup> <sub>2</sub>	31.5	100-2900	278.6	6.00	223-1200	6	In	CNS	1.81	1.55	1.43	1.37	333	333	375	375	375	45
47	G. M. C.	308	T																			

## COMMERCIAL VEHICLE ENGINES—continued

Front End Drive—Type	PISTONS				CONNECTING RODS				CRANKSHAFT				SPARK PLUG		CARBURATOR		OVERALL DIMENSIONS (In.)			Line Number					
	Material	Length (In.)	Weight (with Pins, Rings and Bushing) (Oz.)	Piston Pin—Diameter and Length (In.)	Number of Rings per Piston	Material	Center to Center Length (In.)	Weight—With Bushing and Cap (Oz.)	Material	Counterbalances Used	Crank-pin Length (In.)	Main Bearings Number	Diameter and Length (In.)	Front	Rear	Oil Pressure To	Recommended Make	Thread Size	Size	Weight Without Carburetor or Ignition) Lb.	Width	Height	Length		
HG	CT	2.87	.703x2.43	3	CS	5 <sup>3</sup> / <sub>8</sub>	7	CS	N	1.50x1.18	3	1.75x1.37	1.75x1.78	abcef	18 mm.	7 <sup>1</sup> / <sub>2</sub>	No	310	26	22 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>2</sub>	1			
HG	CT	3.56	.859x2.68	4	CS	7	CS	N	1.93x1.31	3	2.25x1.18	2.25x1.89	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	400	26	26 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	2				
HG	CT	3.56	.859x2.68	4	CS	7	CS	N	1.93x1.31	3	2.25x1.18	2.25x1.89	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	405	26	26 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	3				
HG	CT	3.56	.859x2.68	4	CS	7	CS	N	1.93x1.31	4	2.25x1.21	2.25x1.81	abg	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	410	26	26 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	4				
Ch	CT	3.75	.859x2.49	4	CS	7	CS	Y	1.93x1.31	4	2.25x1.21	2.25x1.81	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	481	26	27 <sup>1</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	5				
Ch	CT	3.75	.859x2.68	4	CS	7	CS	Y	1.93x1.31	4	2.25x1.21	2.25x1.81	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	491	26	27 <sup>1</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	6				
Ch	CT	3.56	.859x2.68	4	CS	7	CS	Y	1.93x1.31	4	2.25x1.21	2.25x1.81	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	506	26	27 <sup>1</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	7				
Ch	CT	3.56	.859x2.68	4	CS	7	CS	Y	1.93x1.31	4	2.25x1.21	2.25x1.81	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	512	26	27 <sup>1</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	8				
Ch	AI	3.93	.859x2.87	4	CS	8 <sup>3</sup> / <sub>8</sub>	7	CS	Y	2.12x1.37	4	2.37x1.43	2.37x2.06	abce	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	567	26	28 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>2</sub>	9			
HG	CT	4.75	1.10x3.06	4	CS	8 <sup>3</sup> / <sub>8</sub>	7	CS	Y	2.25x1.56	7	2.62x1.56	2.62x2.15	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	750	25 <sup>1</sup> / <sub>2</sub>	28 <sup>1</sup> / <sub>2</sub>	42	10			
HG	CT	4.75	1.10x3.18	4	CS	8 <sup>3</sup> / <sub>8</sub>	7	CS	Y	2.25x1.56	7	2.62x1.56	2.62x2.15	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	760	25 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	42	11			
HG	CT	4.75	1.10x3.43	4	CS	8 <sup>3</sup> / <sub>8</sub>	7	CS	Y	2.25x1.56	7	2.62x1.56	2.62x2.15	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	770	25 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	42	12			
HG	CT	5.31	1.25x3.08	4	CS	9	CS	Y	2.37x1.81	7	2.62x1.65	2.62x2.65	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	925	25 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>2</sub>	44	13				
HG	CT	5.31	1.25x3.08	4	CS	9	CS	Y	2.37x1.81	7	2.62x1.65	2.62x2.65	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	932	25 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>2</sub>	44	14				
HG	CT	5.31	1.25x3.43	4	CS	9	CS	Y	2.37x1.81	7	2.62x1.65	2.62x2.65	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	938	25 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>2</sub>	44	15				
HG	CT	5.31	1.25x3.43	4	CS	9	CS	Y	2.37x1.81	7	2.62x1.65	2.62x2.65	abcef	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	951	25 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>2</sub>	44	16				
Ch	AI	5.31	1.25x3.43	4	CS	9 <sup>1</sup> / <sub>2</sub>	7	CV	N	2.50x1.81	7	2.75x1.56	2.75x2.81	abcefg	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	1298	25 <sup>1</sup> / <sub>2</sub>	36 <sup>1</sup> / <sub>2</sub>	46	17			
Ch	AI	5.31	1.25x3.68	4	CS	9 <sup>1</sup> / <sub>2</sub>	7	CV	N	2.50x1.81	7	2.75x1.75	2.75x2.81	abcefg	18 mm.	11 <sup>1</sup> / <sub>2</sub>	No	1318	25 <sup>1</sup> / <sub>2</sub>	36 <sup>1</sup> / <sub>2</sub>	46	18			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	546	14	14	14	19			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	597	14	14	14	20			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	597	14	14	14	21			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	22			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	23			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	24			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	25			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	26			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	27			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	28			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	29			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	30			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	31			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	32			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	33			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	34			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	35			
Ch	AI	5.31	1.50x3.71	4	CS	10 <sup>1</sup> / <sub>2</sub>	7	CV	Y	2.06x1.00	4	2.50x1.93	2.50x1.87	abce	CH	14 mm.	Str	612	14	14	14	36			
HG	CAS	10.6	.687x2.36	3	AS	6 <sup>1</sup> / <sub>8</sub>	9.5	CAS	Y	1.60x1.54	3	2.00x1.66	2.00x2.00	abce	CH	14 mm.	Str	.81	26	268	18	30			
HG	CAS	15.6	.750x2.84	3	AS	7	16.8	CAS	Y	2.00x1.75	3	2.50x1.72	2.50x2.25	abce	CH	14 mm.	Str	.97	26	475	20	31 <sup>1</sup> / <sub>2</sub>			
HG	CAS	16.8	.750x2.84	3	AS	7	17.2	CAS	Y	2.14x1.75	3	2.50x1.72	2.50x2.25	abce	CH	14 mm.	Str	.97	26	485	18	32 <sup>1</sup> / <sub>2</sub>			
HG	AI	4.37	36.0	1.25x3.12	5	AS	9 <sup>1</sup> / <sub>2</sub>	54	CS	Y	2.37x1.75	7	2.70x2.25	2.70x2.87	abcefg	CH	18 mm.	Zen	1 <sup>1</sup> / <sub>2</sub>	No	1247	40 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	44	40
HG	AI	4.37	36.0	1.25x3.12	5	AS	9 <sup>1</sup> / <sub>2</sub>	54	CS	Y	2.37x1.75	7	2.70x2.25	2.70x2.87	abcefg	CH	18 mm.	Zen	1 <sup>1</sup> / <sub>2</sub>	No	1087	24 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>2</sub>	44	41
HG	AI	4.37	38.0	1.25x3.12	5	AS	9 <sup>1</sup> / <sub>2</sub>	54	CS	Y	2.37x1.75	7	2.70x2.25	2.70x2.87	abcefg	CH	18 mm.	Zen	1 <sup>1</sup> / <sub>2</sub>	No	1247	40 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	44	42
HG	AI	4.37	38.0	1.25x3.12	5	AS	9 <sup>1</sup> / <sub>2</sub>	54	CS	Y	2.37x1.75	7	2.70x2.25	2.70x2.87	abcefg	CH	18 mm.	Zen	1 <sup>1</sup> / <sub>2</sub>	No	1087	24 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>2</sub>	44	43
HG	AI	3.21	18.0	.859x3.12</td																					

## AMERICAN STOCK, MARINE AND

Line Number	MAKE AND MODEL	Designed for	Number of Cylinders Bore and Stroke (In.)	Rated Hp. (A.M.A.)	Maximum Brake Hp. at Specified R.P.M.	Piston Displacement (Cu. In.)	Compression Ratio	Maximum Torque at R.P.M. (Lb. Ft.)	No. of Cylinder's Cast in One Piece	Crankcase—Upper Half Integral with Cylinders	Arrangement	VALVES									
												Exhaust Head Material or S.A.E. No.	Max. Head Diameter (In.)	Min. Port Diameter (In.)	Lift (In.)	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust
1	Hercules	NXA	Tr. M	2-3x4	7.2	13-2000	56.5	5.50	39-1100	2	In	Sil	1.48	1.35	1.25	1.12	250	250	.312	.312	30
2	Hercules	NXB	Tr. M	2-3 $\frac{1}{2}$ x4	8.9	15-6-2000	66.3	5.50	46-1100	2	In	Sil	1.48	1.35	1.25	1.12	250	250	.312	.312	30
3	Hercules	ZXA	Tr. Ind	4-2 $\frac{1}{2}$ x3	10.0	23-3800	58.8	6.10	40-2000	4	In	Sil	1.23	1.10	1.00	.875	200	200	.248	.248	30
4	Hercules	ZXB	Tr. Ind	4-2 $\frac{1}{2}$ x3	11.0	25-3800	64.9	6.10	44-2000	4	In	Sil	1.23	1.10	1.00	.875	200	200	.248	.248	30
5	Hercules	IXA	T. Tr. Ind	4-2 $\frac{1}{2}$ x4	10.0	28-3200	78.0	5.20	55-2000	4	In	Sil	1.48	1.35	1.25	1.12	250	250	.310	.310	30
6	Hercules	IXA	T. Tr. Ind	4-3x4	14.4	40-3200	113	5.50	79-2000	4	In	Sil	1.48	1.35	1.25	1.12	250	250	.310	.310	30
7	Hercules	IXB	T. Tr. Ind	4-3 $\frac{1}{2}$ x4	16.9	47-3200	133	5.20	92-2000	4	In	Sil	1.48	1.35	1.25	1.12	250	250	.310	.310	30
8	Hercules	OOA	T. B. Tr. Ind	4-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	19.6	35-2000	173.2	4.20	107-1200	4	In	Sil	1.75	1.62	1.50	1.37	328	325	.373	.373	45
9	Hercules	OOB	T. B. Tr. Ind	4-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	22.5	38-2000	198.8	4.20	125-1000	4	In	Sil	1.75	1.62	1.50	1.37	326	325	.373	.373	45
10	Hercules	OOD	T. B. Tr. Ind	4-4 $\frac{1}{2}$ x2	25.6	41-2000	226.2	4.20	143-1000	4	In	Sil	1.75	1.62	1.50	1.37	328	325	.373	.373	45
11	Hercules	OX	T. B. Tr. Ind	4-4 $\frac{1}{2}$ x5	25.6	46-1800	251.3	4.30	155-1000	4	In	Sil	1.67	1.87	1.81	1.81	328	326	.373	.373	45
12	Hercules	OXC	T. B. Tr. Ind	4-4 $\frac{1}{2}$ x5	28.9	56-1800	283.5	4.30	185-1600	4	In	Sil	1.67	1.87	1.81	1.81	325	325	.373	.373	45
13	Hercules	K	T. Tr. Ind	4-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	28.9	55-1600	326.3	3.89	202-1000	4	In	Sil	2.25	2.25	2.00	2.00	328	326	.434	.434	45
14	Hercules	L	T. Tr. Ind	4-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	32.4	59-1600	365.8	3.78	226-1000	4	In	Sil	2.25	2.25	2.00	2.00	325	325	.434	.434	45
15	Hercules	G	T. Tr. Ind	4-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	35.1	63-1600	407.6	3.89	250-1000	4	In	Sil	2.25	2.25	2.00	2.00	323	325	.434	.434	45
16	Hercules	E	T. Tr. Ind	4-5 $\frac{1}{2}$ x5	40.0	74-1600	451.4	4.00	288-1000	4	In	Sil	2.25	2.25	2.00	2.00	323	325	.434	.434	45
17	Hercules	TX	Ind	4-5 $\frac{1}{2}$ x7	48.4	88-1200	665.0	3.84	425-800	4	In	Sil	2.90	2.90	2.50	2.50	375	375	.497	.497	45
18	Hercules	TXA	Ind	4-6x7	57.6	98-1200	792.0	3.84	488-800	4	In	Sil	2.90	2.90	2.50	2.50	375	375	.497	.497	45
19	Hercules	TXO	Ind	4-6 $\frac{1}{2}$ x7	65.0	112-1200	894.0	3.84	586-800	4	In	Sil	2.90	2.90	2.50	2.50	375	375	.497	.497	45
20	Hercules	QXA	T. B. Tr. Ind	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	23.4	59-3000	190	5.50	130-1000	6	In	Sil	1.48	1.35	1.31	1.12	281	281	.310	.310	30
21	Hercules	QXB	T. B. Tr. M	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	25.3	65.5-2500	205.0	5.85	143-1000	6	In	Sil	1.48	1.39	1.31	1.12	281	281	.312	.312	30
22	Hercules	QXC	T. B. Tr. M	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.3	70.5-3500	221.0	5.85	154-1000	6	In	Sil	1.60	1.39	1.43	1.12	281	281	.312	.312	30
23	Hercules	JXA	T. B. Tr. Ind	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.3	63-2800	228.0	5.16	141-1000	6	In	Sil	1.75	1.62	1.50	1.37	322	322	.373	.373	45
24	Hercules	JXB	T. B. Tr. Ind	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	31.5	68-2800	263.0	5.40	163-1000	6	In	Sil	1.75	1.62	1.50	1.37	322	322	.373	.373	45
25	Hercules	JXC	T. B. Tr. Ind	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	33.7	73-2800	282.0	5.35	175-1000	6	In	Sil	1.75	1.62	1.50	1.37	322	322	.373	.373	45
26	Hercules	JXD	T. B. Tr. Ind	6-4x4 $\frac{1}{2}$	38.4	84-2400	320.0	5.63	204-1000	6	In	Sil	1.75	1.62	1.50	1.37	322	322	.373	.373	45
27	Hercules	WXC	T. B. Tr. Ind	6-4 $\frac{1}{2}$ x4 $\frac{1}{2}$	38.4	90-2400	339.0	5.00	212-1000	6	In	Sil	1.75	1.75	1.62	1.50	355	355	.373	.373	45
28	Hercules	WXC-2	T. B. Tr. Ind	6-4 $\frac{1}{2}$ x4 $\frac{1}{2}$	40.8	95-2400	360.8	5.00	233-1000	6	In	Sil	1.75	1.75	1.62	1.50	355	355	.373	.373	45
29	Hercules	WXC-3	T. B. Tr. Ind	6-4 $\frac{1}{2}$ x4 $\frac{1}{2}$	43.3	101-2400	383.0	5.00	262-1000	6	In	Sil	1.75	1.75	1.62	1.50	355	355	.373	.373	45
30	Hercules	YXC	T. B. Tr. Ind	6-4 $\frac{1}{2}$ x4 $\frac{1}{2}$	45.9	94-2200	428.4	4.40	281-800	6	In	Sil	2.00	2.00	1.75	1.75	383	383	.373	.373	45
31	Hercules	YXC-2	T. B. Tr. Ind	6-4 $\frac{1}{2}$ x4 $\frac{1}{2}$	48.6	98-2200	543.0	4.77	300-800	6	In	Sil	2.00	2.00	1.75	1.75	398	398	.373	.373	45
32	Hercules	YXC-3	T. B. Tr. Ind	6-4 $\frac{1}{2}$ x4 $\frac{1}{2}$	51.3	104-2200	478.8	4.40	320-800	6	In	Sil	2.00	2.00	1.75	1.75	388	388	.373	.373	45
33	Hercules	RXL	T. B. Tr. M	6-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	51.3	135-2200	529.2	5.40	388-1000	6	In	Sil	2.00	2.00	1.75	1.75	388	388	.375	.375	45
34	Hercules	RXB	T. B. Tr. Ind	6-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	48.6	110-2200	500.9	4.95	330-1000	6	In	Sil	2.00	2.00	1.75	1.75	388	388	.373	.373	45
35	Hercules	RXC	T. B. Tr. Ind	6-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	51.3	114-2200	529.2	4.95	350-1000	6	In	Sil	2.00	2.00	1.75	1.75	388	388	.375	.375	45
36	Hercules	RXL	T. B. Tr. M	6-4 $\frac{1}{2}$ x5 $\frac{1}{2}$	54.2	142-2200	558.2	5.40	407-1000	6	In	Sil	2.00	2.00	1.81	1.75	398	398	.375	.375	45
37	Hercules	HXB	T. B. Tr. Ind	6-5x6	60.0	148-2000	707.0	4.50	455-1000	3	Se	Sil	2.44	2.31	2.12	2.00	458	458	.498	.498	30
38	Hercules	HXC	T. B. Tr. Ind	6-5 $\frac{1}{2}$ x6	66.2	164-2000	779.0	4.50	510-1000	3	Se	Sil	2.44	2.31	2.12	2.00	458	458	.498	.498	30
39	Hercules	HXD	T. B. Tr. Ind	6-5 $\frac{1}{2}$ x6	72.8	180-2000	855.0	4.50	555-1000	3	Se	Sil	2.44	2.31	2.12	2.00	458	458	.498	.498	30
40	Hercules	HXE	T. B. Tr. Ind	6-5 $\frac{1}{2}$ x6	79.4	198-2000	935.0	4.50	615-1000	3	Se	Sil	2.44	2.31	2.12	2.00	458	458	.498	.498	30
41	International	U-7	PU	4-3 $\frac{1}{2}$ x5	22.5	34.5-1200	220.9	4.80	153-1000	W	Se	W	1.78	1.78	1.55	1.55	402	402	.432	.432	45
42	International	U-10	PU	4-4 $\frac{1}{2}$ x6	28.9	45-1200	283.7	4.67	207-1000	W	Se	W	1.80	1.75	1.68	1.48	441	441	.432	.432	45
43	International	300	PU	4-4 $\frac{1}{2}$ x6	36.1	56.5-1050	425.3	4.74	300-750	W	Se	W	2.18	2.18	1.75	1.93	381	381	.432	.432	45
44	International	PA-40	PU	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	31.5	59-1800	278.7	4.53	182-1200	W	Se	W	1.87	1.75	1.62	1.50	343	343	.372	.372	45
45	International	PA-50	PU	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	33.7	66-2000	298.2	5.72	200-1200	W	Se	W	1.87	1.75	1.62	1.50	343	343	.372	.372	45
46	International	PA-100	PU	6-5 $\frac{1}{2}$ x4 $\frac{1}{2}$	60.0	110-1400	648.0	5.30	447-700	W	Se	W	2.37	2.37	2.12	2.12	437	437	.45	.45	45
47	International	FC-132	T	4-3 $\frac{1}{2}$ x4	16.8	33-2000	132.7	6.00	89-1200	4	In	Sil	1.34	1.18	1.18	1.18	310	310	.310	.310	45
48	International	HD-213	T	6-3 $\frac{1}{2}$ x4 $\frac{1}{2}$	26.3	78-3400	213.2	6.30	155-1000	6	In	Sil	1.68	1.43	1.50	1.34	320	320	.370	.370	45
49	International	HD-232	T	6-3<math																	

## COMMERCIAL VEHICLE ENGINES—continued

Front End Drive—Type	PISTONS				CONNECTING RODS				CRANKSHAFT				Oil Pressure To	Recommended Make	SPARK PLUG	CARBURETOR	OVERALL DIMENSIONS (In.)			Line Number				
	Material	Length (In.)	Weight (with Pins, Rings and Bushing) (Oz.)	Piston Pin—Diameter and Length (In.)	Number of Rings per Piston				Material	Center to Center Length (In.)	Weight—With Bushing and Cap (Oz.)	Crank-pin	Main Bearings		Diameter and Length (In.)	Thread Size	Size	Adapted for Use of Kerosene or Distillate	Weight (Without Carburetor or Ignition) (Lbs.)					
					Material	Center to Center Length (In.)	Weight and Cap (Oz.)	Number					Diameter and Length (In.)	Front	Rear									
HG	CI	3.06	28.0	.750x2.56	3	AS	6 <sup>1</sup> / <sub>2</sub>	21	CS	Y	1.75x1.12	2	2.00x1.56	2.00x1.62	abe	Op	7 <sup>1</sup> / <sub>2</sub> -18	Op	K	270	15 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub>	1
HG	CI	3.06	29.5	.750x2.81	3	AS	6 <sup>1</sup> / <sub>2</sub>	21	CS	Y	1.75x1.12	2	2.00x1.56	2.00x1.62	abe	Op	14 mm.	Op	K-D	270	15 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>2</sub>	2
HG	CI	2.68	17.5	.687x2.18	3	3140	5 <sup>1</sup> / <sub>2</sub>	15.5	1045	N	1.50x1.00	3	2.00x1.31	2.00x1.37	abe	Op	14 mm.	Op	K-D	179	14 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>2</sub>	4
HG	CI	2.68	19.0	.687x2.18	3	3140	5 <sup>1</sup> / <sub>2</sub>	15.5	1045	N	1.50x1.00	3	2.00x1.31	2.00x1.37	abe	Op	18 mm.	Op	K-D	250	16 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>2</sub>	5
HG	CI	2.43	18.0	.750x2.18	3	3140	6 <sup>1</sup> / <sub>2</sub>	21	1045	N	1.75x1.12	3	2.00x1.56	2.00x1.62	abe	Op	18 mm.	Op	K-D	283	21 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>2</sub>	6
HG	CI	3.08	28.0	.750x2.56	3	3140	6 <sup>1</sup> / <sub>2</sub>	21	1045	N	1.75x1.12	3	2.00x1.56	2.00x1.62	abe	Op	18 mm.	Op	K-D	291	16 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>2</sub>	7
HG	CI	3.06	29.5	.750x2.81	3	3140	6 <sup>1</sup> / <sub>2</sub>	21	1045	N	1.75x1.12	3	2.00x1.56	2.00x1.62	abe	Op	18 mm.	Op	K-D	460	17 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	8
HG	CI	4.31	49.0	1.00x3.12	3	1035	8	37.5	1045	N	2.00x1.50	3	2.00x2.18	2.00x2.62	abe	Op	18 mm.	Op	K-D	460	17 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	9
HG	CI	4.12	56.5	1.00x3.37	3	1035	8	37.5	1045	N	2.00x1.50	3	2.00x2.18	2.00x2.62	abe	Op	18 mm.	Op	K-D	460	17 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	10
HG	CI	4.31	56.0	1.00x3.62	3	1035	8	37.5	1045	N	2.00x1.50	3	2.00x2.18	2.00x2.62	abe	Op	18 mm.	Op	K-D	655	20 <sup>1</sup> / <sub>2</sub>	28 <sup>1</sup> / <sub>2</sub>	36 <sup>1</sup> / <sub>2</sub>	11
HG	CI	4.87	67.5	1.37x2.37	5	1035	9 <sup>1</sup> / <sub>2</sub>	58.5	1045	N	2.00x2.25	3	2.00x3.18	2.00x3.31	abe	Op	18 mm.	Op	K-D	655	20 <sup>1</sup> / <sub>2</sub>	28 <sup>1</sup> / <sub>2</sub>	36 <sup>1</sup> / <sub>2</sub>	12
HG	CI	4.87	73.5	1.37x2.37	5	1035	9 <sup>1</sup> / <sub>2</sub>	58.5	1045	N	2.00x2.25	3	2.00x3.18	2.00x3.31	abe	Op	18 mm.	Op	K-D	675	21 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>2</sub>	13
HG	CI	5.25	82.5	1.50x3.75	5	1035	10 <sup>1</sup> / <sub>2</sub>	63	1045	N	2.50x2.62	3	3.00x3.37	3.00x3.50	abe	Op	18 mm.	Op	K-D	880	21 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>2</sub>	14
HG	CI	5.25	95.5	1.50x4.00	5	1035	10 <sup>1</sup> / <sub>2</sub>	63	1045	N	2.50x2.62	3	3.00x3.37	3.00x3.50	abe	Op	18 mm.	Op	K-D	885	21 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>2</sub>	15
HG	CI	5.25	103.0	1.50x4.25	5	1035	10 <sup>1</sup> / <sub>2</sub>	63	1045	N	2.50x2.62	3	3.00x3.37	3.00x3.50	abe	Op	18 mm.	Op	K-D	890	21 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>2</sub>	16
HG	CI	7.00	196.8	1.87x4.87	5	1035	13 <sup>1</sup> / <sub>4</sub>	178	1045	N	3.00x3.00	3	3.75x4.50	3.75x4.50	abe	Op	18 mm.	Op	K-D	1800	26 <sup>1</sup> / <sub>2</sub>	38	52 <sup>1</sup> / <sub>2</sub>	17
HG	CI	7.00	222.5	1.87x5.75	5	1035	13 <sup>1</sup> / <sub>4</sub>	178	1045	N	3.00x3.00	3	3.75x4.37	3.75x4.50	abe	Op	18 mm.	Op	K-D	1815	26 <sup>1</sup> / <sub>2</sub>	38	52 <sup>1</sup> / <sub>2</sub>	18
HG	CI	3.50	52.7	.875x2.67	4	1035	7	26	CS	Op	1.98x1.02	7	2.50x1.39	2.50x1.93	abe	Op	18 mm.	Op	K-D	480	21 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	20
HG	CI	3.50	52.7	.875x2.79	4	CS	7	26	CS	Op	2.00x1.25	7	2.50x1.31	2.50x1.93	abe	Op	18 mm.	Op	K	550	17 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>2</sub>	23
HG	AI	3.50	52.7	.875x2.90	4	CS	7	26	CS	Op	2.00x1.25	7	2.50x1.31	2.50x1.93	abe	Op	18 mm.	Op	K-D	565	17 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>2</sub>	24
HG	CI	4.37	43.0	1.00x2.90	4	1035	8	37.5	1045	Op	2.00x1.50	7	2.50x1.31	2.50x2.12	abe	Op	18 mm.	Op	K	570	17 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>2</sub>	25
HG	CI	4.18	48.0	1.00x3.15	4	1035	8	37.5	1045	Op	2.00x1.50	7	2.50x1.31	2.50x2.12	abe	Op	18 mm.	Op	K-D	580	21 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>2</sub>	26
HG	CI	4.12	56.5	1.00x3.37	4	1035	8	37.5	1045	Op	2.00x1.50	7	2.50x1.31	2.50x2.12	abe	Op	18 mm.	Op	K-D	585	21 <sup>1</sup> / <sub>2</sub>	23 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>2</sub>	27
HG	AI	4.18	40.5	1.00x3.51	5	1035	8	37.5	1045	Op	2.00x1.50	7	2.50x1.31	2.50x2.12	abe	Op	18 mm.	Op	K-D	595	21 <sup>1</sup> / <sub>2</sub>	31	45 <sup>1</sup> / <sub>2</sub>	31
HG	CI	4.56	64.5	1.12x3.56	5	1035	9 <sup>1</sup> / <sub>2</sub>	51	1045	Op	2.25x1.50	7	2.62x1.75	2.62x2.75	abe	Op	18 mm.	Op	K-D	595	21 <sup>1</sup> / <sub>2</sub>	31	45 <sup>1</sup> / <sub>2</sub>	32
HG	CI	4.56	65.0	1.12x3.62	5	1035	9 <sup>1</sup> / <sub>2</sub>	51	1045	Op	2.25x1.50	7	2.62x1.75	2.62x2.75	abe	Op	18 mm.	Op	K-D	605	21 <sup>1</sup> / <sub>2</sub>	31	45 <sup>1</sup> / <sub>2</sub>	33
HG	CI	4.56	83.0	1.20x3.68	5	1035	9 <sup>1</sup> / <sub>2</sub>	51	1045	Op	2.25x1.50	7	2.62x1.75	2.62x2.75	abe	Op	18 mm.	Op	K-D	610	21 <sup>1</sup> / <sub>2</sub>	31	45 <sup>1</sup> / <sub>2</sub>	34
HG	CI	4.37	43.0	1.00x2.90	4	1035	8	37.5	1045	Op	2.00x1.50	7	2.50x1.31	2.50x2.12	abe	Op	18 mm.	Op	K	1000	21 <sup>1</sup> / <sub>2</sub>	31	45 <sup>1</sup> / <sub>2</sub>	35
HG	AI	4.37	43.0	1.00x2.90	4	1035	8	37.5	1045	Op	2.00x1.50	7	2.50x1.31	2.50x2.12	abe	Op	18 mm.	Op	K-D	1010	21 <sup>1</sup> / <sub>2</sub>	31	44 <sup>1</sup> / <sub>2</sub>	36
HG	AI	6.50	95.0	1.50x4.43	4	3140	12	143	1045	Op	3.00x2.25	7	3.50x3.27	3.50x3.50	abe	Op	18 mm.	Op	K	1810	24 <sup>1</sup> / <sub>2</sub>	40 <sup>1</sup> / <sub>2</sub>	54 <sup>1</sup> / <sub>2</sub>	37
HG	AI	6.87	105.0	1.50x5.46	4	3140	12	143	1045	Op	3.00x2.25	7	3.50x3.27	3.50x3.50	abe	Op	18 mm.	Op	K-D	1810	24 <sup>1</sup> / <sub>2</sub>	40 <sup>1</sup> / <sub>2</sub>	54 <sup>1</sup> / <sub>2</sub>	38
HG	AI	6.87	117.5	1.50x4.81	4	3140	12	143	1045	Op	3.00x2.25	7	3.50x3.27	3.50x3.50	abe	Op	18 mm.	Op	K	1830	24 <sup>1</sup> / <sub>2</sub>	40 <sup>1</sup> / <sub>2</sub>	54 <sup>1</sup> / <sub>2</sub>	39
HG	AI	7.25	127.5	1.50x5.06	4	3140	12	143	1045	Op	3.00x2.25	7	3.50x3.27	3.50x3.50	abe	Op	18 mm.	Op	K-D	1830	24 <sup>1</sup> / <sub>2</sub>	40 <sup>1</sup> / <sub>2</sub>	54 <sup>1</sup> / <sub>2</sub>	40
HG	CI	4.71	63.0	1.29x3.37	4	AS	10	73	CNS	N	2.25x2.23	24	SAE-313	SAE-313	abe	Op	18 mm.	Op	Zen	1 <sup>1</sup> / <sub>2</sub>	31	44 <sup>1</sup> / <sub>2</sub>	33	
HG	CI	6.03	95.0	1.29x3.68	4	AS	11 <sup>1</sup> / <sub>2</sub>	102.4	CNS	N	2.62x2.73	24	SAE-314	SAE-314	abe	Op	18 mm.	Op	Zen	1 <sup>1</sup> / <sub>2</sub>	31	44 <sup>1</sup> / <sub>2</sub>	41	
HG	CI	5.82	122.0	1.48x4.12	4	AS	13	152	CNS	N	3.12x2.73	24	SAE-315	SAE-315	abe	Op	18 mm.	Op	Zen	1 <sup>1</sup> / <sub>2</sub>	31	44 <sup>1</sup> / <sub>2</sub>	42	
HG	CI	3.93	45.0	1.10x3.05	4	AS	9 <sup>1</sup> / <sub>2</sub>	49	CNS	N	2.25x1.62	7	2.70x1.53	2.70x2.54	abe	Op	18 mm.	Op	Zen	1 <sup>1</sup> / <sub>2</sub>	31	44 <sup>1</sup> / <sub>2</sub>	43	
HG	CI	4.56	34.4	1.10x3.17	4	AS	9 <sup>1</sup> / <sub>2</sub>	49	CNS	N	2.25x1.62	7	2.70x1.53	2.70x2.54	abe	Op	18 mm.	Op	Zen	1 <sup>1</sup> / <sub>2</sub>	31	44 <sup>1</sup> / <sub>2</sub>	44	
HG	CI	5.75	130.0	1.50x4.10	4	AS	11 <sup>1</sup> / <sub>2</sub>	137	CNS	N	2.75x2.25	7	3.25x3.50	3.25x3.50	abe</									

## AMERICAN STOCK, MARINE AND

Line Number	MAKE AND MODEL	Designed for	Number of Cylinders Bore and Stroke (In.)	Rated H.P. (A.M.A.)	Maximum Brake H.P. at Specified R.P.M.	Piston Displacement (Cu. In.)	Compression Ratio	Maximum Torque at R.P.M. (Lb. Ft.)	No. of Cylinders Cast in One Piece	Crankcase—Upper Half Integral with Cylinders	VALVES									
											Arrangement	Exhaust Head Material or S.A.E. No.	Max. Head Diameter (In.)	Min. Port Diameter (In.)	Lift (In.)		Stem Diameter (In.)			
															Intake	Exhaust	Intake	Exhaust		
1 Lehman-Ford	V5 M	8-3 1/2 x 3 3/4	85-3200	221.0	6.12	140-2000	8	In	L	CNS	1.53	1.53	1.53	1.53	.307	.307	.310	.310	45	
2 Lehman-Mercury	M5 M	8-3 1/2 x 3 3/4	95-3600	239.0	6.12	170-2100	8	In	L	CNS	1.53	1.53	1.53	1.53	.307	.307	.310	.310	45	
3 Lehman-Zephyr	Z5 M	12-2 1/2 x 3 3/4	110-3600	267.2	6.70	186-2000	12	In	L	CNS	1.54	1.42	1.37	1.25	.281	.281	.343	.343	30	
4 Lycoming	DC T	4-3 1/2 x 3 7/8	17.5	30-2500	134.0	5.75	92-1000	4	In	Sil	1.68	1.53	1.50	1.37	.312	.312	.343	.343	45	
5 Lycoming	AFD Ind	4-3 1/2 x 4 1/2	22.5	37-1600	198.8	4.82	134-570	4	In	Sil	1.65	1.65	1.50	1.37	.312	.312	.343	.343	45	
6 Lycoming	AFC T	4-3 1/2 x 4 1/2	22.5	49-2600	198.8	4.82	135-1150	4	In	Sil	1.58	1.40	1.37	1.25	.312	.312	.343	.343	45	
7 Lycoming	WF C	6-3 1/2 x 4 1/2	22.5	82-3500	209.9	6.20	155-1800	6	In	Sil	1.93	1.81	1.75	1.62	.312	.312	.375	.375	(h)	
8 Lycoming	ASE T, B	6-3 1/2 x 4 1/2	33.7	90-3100	298.2	5.26	205-900	6	In	Sil	1.56	1.40	1.37	1.25	.281	.281	.343	.343	(h)	
9 Lycoming	GFD Ta	8-3 1/2 x 4 1/2	30.0	74-2800	279.3	5.75	192-800	8	In	Sil	1.56	1.40	1.37	1.25	.312	.312	.343	.343	(h)	
10 Lycoming	GG C	8-3 1/2 x 4 1/2	30.0	113-3600	279.9	6.67	210-1800	8	In	Sil	1.56	1.40	1.37	1.25	.312	.312	.343	.343	(h)	
11 Lycoming	FB C	8-3 1/2 x 4 3/4	39.2	115-3500	288.6	6.32	222-2000	8	In	HB	1.68	1.50	1.50	1.37	.343	.343	.343	.343	(h)	
12 Lycoming	AEF T, B	8-3 1/2 x 4 3/4	45.0	120-2800	419.6	5.26	302-1200	8	In	Sil	1.93	1.62	1.75	1.50	.343	.343	.375	.375	(h)	
13 Lycoming	GH C	8-3 1/2 x 4 3/4	30.0	148-2000	279.9	6.67	232-2400	8	In	Sil	1.56	1.40	1.37	1.25	.312	.312	.343	.343	(h)	
14 Lycoming	FC C	8-3 1/2 x 4 3/4	39.2	175-4200	288.6	6.32	258-2800	8	In	HB	1.68	1.50	1.50	1.37	.343	.343	.343	.343	(h)	
15 Lycoming	BF T	12-3 1/2 x 4 1/2	58.8	170-3300	490.6	7.04	364-1300	12	In	HH	1.65	1.56	1.37	1.37	.343	.343	.343	.343	30	
16 Lycoming	EUF Ind	12-4 1/2 x 4 3/4	108.3	245-1800	1010.1	5.12	12	In	HH	2.21	2.09	2.00	1.81	.437	.437	.437	.437	30		
17 Lycoming	UAG M	4-3 1/2 x 3 7/8	—	58-3400	134.0	6.50	106-1800	4	In	L	Sil	1.54	1.42	1.37	1.25	.312	.312	.343	.343	30
18 Lycoming	UAGS M	4-3 1/2 x 3 7/8	—	80-4500	134.0	8.80	—	4	In	L	Sil	1.54	1.54	1.37	1.25	.375	.375	.343	.343	30
19 Lycoming	UF M	12-4 1/2 x 4 3/4	—	325-2500	1010.1	5.12	750-1700	12	In	HH	2.21	2.09	2.00	1.81	.437	.437	.437	.437	30	
20 Lycoming	UFD M	12-4 1/2 x 4 3/4	—	325-2500	1010.1	5.12	750-1700	12	In	HH	2.21	2.09	2.00	1.81	.437	.437	.437	.437	30	
21 Lycoming	UHB M	6-3 1/2 x 4 3/4	—	175-5000	222.9	6.70	170-2000	6	In	L	Sil	1.56	1.40	1.37	1.25	.312	.312	.343	.343	(h)
22 Lycoming	UHBD M	6-3 1/2 x 4 3/4	—	175-5000	222.9	6.70	170-2000	6	In	L	Sil	1.56	1.40	1.37	1.25	.375	.375	.343	.343	(h)
23 Lycoming	UHET M	6-3 1/2 x 4 3/4	—	95-3400	222.9	6.70	—	6	In	L	Sil	1.46	1.34	1.37	1.25	.375	.375	.343	.343	(h)
24 Lycoming	UJ M	8-3 1/2 x 4 3/4	—	125-3400	297.2	6.70	220-1700	8	In	L	Sil	1.56	1.40	1.37	1.25	.312	.312	.343	.343	(h)
25 Lycoming	UJD M	8-3 1/2 x 4 3/4	—	125-3400	297.2	6.70	220-1700	8	In	L	Sil	1.56	1.40	1.37	1.25	.312	.312	.343	.343	(h)
26 Lycoming	UEB M	8-3 1/2 x 4 3/4	—	165-3200	419.6	6.10	305-2000	8	In	L	Sil	1.93	1.81	1.75	1.62	.343	.343	.375	.375	(h)
27 Lycoming	UEBD M	8-3 1/2 x 4 3/4	—	165-3200	419.6	6.10	305-2000	8	In	L	Sil	1.93	1.81	1.75	1.62	.343	.343	.375	.375	(h)
28 Mack	ENII T	6-3 1/2 x 4 3/4	—	125-3400	297.2	6.70	220-1700	8	In	L	Sil	1.76	1.51	1.62	1.37	.354	.354	.406	.406	(h)
29 Mack	FO T, B	6-3 1/2 x 4 3/4	24.4	67-3000	210.0	5.65	145-1100	6	In	L	Sil	1.76	1.51	1.62	1.37	.354	.354	.406	.406	(h)
30 Mack	FM T, B	6-3 1/2 x 4 3/4	24.4	80-3000	210.0	5.65	188-1200	6	In	L	Sil	1.76	1.51	1.62	1.37	.354	.354	.406	.406	(h)
31 Mack	FK T, B	6-3 1/2 x 4 3/4	33.8	94-3000	290.0	5.68	200-1200	6	In	L	Sil	1.76	1.51	1.62	1.37	.354	.354	.406	.406	(h)
32 Mack	BG T, B	6-3 1/2 x 4 3/4	31.6	96-2800	309.6	5.40	210-1000	6	In	L	MS	1.89	1.76	1.62	1.50	.365	.365	.375	.375	30
33 Mack	CU T, B	6-3 1/2 x 5	36.0	103-2600	353.8	5.25	250-1000	6	In	L	MS	1.89	1.76	1.62	1.50	.365	.365	.375	.375	30
34 Mack	CE T, B	6-4 1/2 x 5	38.4	108-2400	414.6	5.00	270-1000	6	Se	L	MS	2.17	2.01	1.81	1.68	.375	.375	.500	.500	30
35 Mack	CF T, B	6-4 1/2 x 5	43.3	118-2400	467.9	5.00	310-1000	6	Se	L	MS	2.17	2.01	1.81	1.68	.375	.375	.500	.500	30
36 Mack	CT T, B	6-4 1/2 x 5 1/2	48.6	126-2400	524.8	4.80	350-1000	6	Se	L	MS	2.17	2.01	1.81	1.68	.375	.375	.500	.500	30
37 Mack	EO T, B	6-4 1/2 x 5 1/2	45.7	148-2200	519.0	5.50	380-1000	6	In	L	MS	2.18	1.88	2.04	1.75	.500	.500	.437	.437	30
38 Mack	EP T, B	6-4 1/2 x 5 1/2	54.1	160-2200	611.0	5.40	465-900	6	In	L	MS	2.18	1.89	2.04	1.75	.500	.500	.437	.437	30
39 Mack	EY T, B	6-5x6	60.0	170-2100	706.5	5.30	500-800	6	In	L	MS	2.18	1.89	2.04	1.75	.500	.500	.437	.437	30
40 Minneapolis-Moline	RE Tr	4-3 1/2 x 4 1/2	26.0	31-1500	185.7	4.50	114-1100	2	In	F	Sil	1.47	1.47	1.25	1.25	.355	.355	.341	.341	45
41 Minneapolis-Moline	KEA Tr	4-4 1/2 x 5	33.0	39-1150	283.7	4.33	181-1000	4	Se	L	Sil	1.72	1.50	1.50	1.37	.488	.488	.375	.375	45
42 Minneapolis-Moline	KEC Tr	4-4 1/2 x 5	36.0	42-1275	283.7	4.33	181-1000	4	Se	L	Sil	1.72	1.50	1.50	1.37	.488	.488	.437	.437	45
43 Minneapolis-Moline	KED Tr	4-4 1/2 x 5	39.0	46-1275	283.7	5.60	199-1050	4	Se	L	Sil	1.72	1.50	1.50	1.37	.488	.488	.437	.437	45
44 Minneapolis-Moline	GE Tr	4-4 1/2 x 6	46.0	54-1075	403.2	4.25	273-850	2	Se	L	Sil	1.84	1.72	1.82	1.62	.488	.488	.437	.437	45
45 Murray & Tregurtha	OC-4 M	4-6 1/2 x 8	—	80-1000	1062.4	3.33	550-600	2	Se	L	Spec	2.45	2.46	2.25	2.25	.500	.500	.437	.437	30
46 Murray & Tregurtha	M-4 M	4-6 1/2 x 8	—	90-1000	1062.4	4.20	660-700	2	Se	L	Spec	2.45	2.46	2.25	2.25	.500	.500	.437	.437	30
47 Murray & Tregurtha	K-6 M	6-6 1/2 x 7 3/4	—	325-1650	1426.6	2.25	1110-1525	3	Se	L	Spec	2.45	2.46	2.25	2.25	.375	.375	.437	.437	30
48 Murray & Tregurtha	OC-6 M	6-6 1/2 x 8	—	140-1100	1593.6	3.33	910-600	2	Se	L	Spec	2.46	2.45	2.25	2.25	.500	.500	.437	.437	30
49 Murray & Tregurtha	M-6 M	6-6 1/2 x 8	—	175-1100	1593.6	4.20	882-655	2	Se	L	Spec	2.46	2.46	2.25	2.25	.500	.500	.437	.437	30
50 Murray & Tregurtha	OCX-6 M	6-7 1/2 x 8	—	175-1100	1981.4	4.00	1030-800	2	Se	L	Spec	2.71	2.45	2.37	2.25	.531	.531	.437	.437	30
51 Plymouth	PT-81 T	6-3 1/2 x 4 3/4	23.4	70-3000	201.3	6.70	148-1200	6	In	L	Sil	1.48	1.46	1.31	1.31	.312	.312	.340	.340	45
52 Reg																				

## COMMERCIAL VEHICLE ENGINES—continued

Front End Drive Type	PISTONS				CONNECTING RODS				CRANKSHAFT				Oil Pressure To	Recommended Make	SPARK PLUG	CARBURATOR	OVERALL DIMENSIONS (In.)							
	Material	Length (In.)	Weight (with Pins, Rings and Bushing) (Oz.)	Piston Pin—Diameter and Length (In.)	Number of Rings per Piston	Material	Center to Center Length (In.)	Weight—With Bushing and Cap (Oz.)	Main Bearings		Thread Size	Size		Width	Height	Length								
									Material	Counterbalances Used	Crank-pin	Main Bearings												
HG	CAS	15.6	.750x2.84	3	AS	CAS	Y	2.00x...	3	2.40x1.41	2.40x1.86	abce	CH	14 mm.	Str	.97	No	695	22 <sup>3</sup> / <sub>4</sub>	30 <sup>1</sup> / <sub>2</sub>	47	1		
HG	CAS	16.8	.750x2.84	3	AS	CAS	Y	2.00x...	3	2.40x1.41	2.40x1.86	abce	CH	14 mm.	Str	1 <sup>1</sup> / <sub>2</sub>	No	695	22 <sup>3</sup> / <sub>4</sub>	30 <sup>1</sup> / <sub>2</sub>	47	2		
HG	CAS	17.0	.750x2.84	3	AS	CAS	N	1.75x1.50	3	1.87x1.56	1.87x1.61	abce	Op	18 mm.	Op	1	No	790	31 <sup>1</sup> / <sub>2</sub>	59 <sup>1</sup> / <sub>2</sub>	52	3		
HG	AI	3.68	.22.0	.750x1.87	3	CS	8	.30	CS	2.12x1.50	2.12x2.37	abce	Op	7 <sup>1</sup> / <sub>2</sub> -18	Op	1	No	348	17 <sup>1</sup> / <sub>2</sub>	26	42	4		
HG	CI	4.50	.45.7	.875x3.21	4	CS	9	41.6	CS	2.12x1.50	2.12x2.37	abce	Op	7 <sup>1</sup> / <sub>2</sub> -18	Op	1	No	485	19 <sup>1</sup> / <sub>2</sub>	29	42	6		
Ch	Al	3.75	.21.9	.875x2.50	4	CS	9 <sup>1</sup> / <sub>2</sub>	37.4	CS	2.18x1.25	2.37x1.93	2.37x1.87	abce	Op	14 mm.	Op	1 <sup>1</sup> / <sub>2</sub>	No	475	25 <sup>3</sup> / <sub>4</sub>	33	30 <sup>1</sup> / <sub>2</sub>	7	
HG	AI	4.25	.36.0	1.00x3.21	4	CS	9	54.4	CS	2.34x1.65	2.62x2.12	2.62x2.75	abce	Op	18 mm.	Op	1 <sup>1</sup> / <sub>2</sub>	No	525	23 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	34 <sup>1</sup> / <sub>2</sub>	8	
Ch	CI	3.75	.32.0	.875x2.50	4	CS	9 <sup>1</sup> / <sub>2</sub>	38.7	CS	2.12x1.50	2.37x1.93	2.37x1.87	abce	Op	18 mm.	Op	1 <sup>1</sup> / <sub>2</sub>	No	785	25 <sup>3</sup> / <sub>4</sub>	31	42 <sup>1</sup> / <sub>2</sub>	9	
Ch	Al	3.75	.21.9	.875x2.50	4	CS	9 <sup>1</sup> / <sub>2</sub>	37.4	CS	2.12x1.25	2.37x1.93	2.37x1.87	abce	Op	14 mm.	Op	1	No	680	22 <sup>3</sup> / <sub>4</sub>	29 <sup>1</sup> / <sub>2</sub>	43	10	
Ch	AI	3.93	.26.5	.875x2.50	4	CS	7 <sup>1</sup> / <sub>2</sub>	31.6	CS	2.00x1.18	2.50x1.75	2.50x2.25	abce	Op	14 mm.	Op	1	No	610	22 <sup>3</sup> / <sub>4</sub>	29 <sup>1</sup> / <sub>2</sub>	43	11	
HG	AI	4.25	.34.4	1.00x3.21	4	CS	9	54.4	CS	2.34x1.65	2.62x2.12	2.62x2.75	abce	Op	18 mm.	Op	1 <sup>1</sup> / <sub>2</sub>	No	1110	25 <sup>3</sup> / <sub>4</sub>	34 <sup>1</sup> / <sub>2</sub>	52 <sup>1</sup> / <sub>2</sub>	12	
Ch	Al	3.75	.21.9	.875x2.50	4	CS	9 <sup>1</sup> / <sub>2</sub>	37.4	CS	2.12x1.25	2.37x1.93	2.37x1.87	abce	Op	14 mm.	Op	1 <sup>1</sup> / <sub>2</sub>	No	705	28 <sup>3</sup> / <sub>4</sub>	29 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>2</sub>	13	
Ch	AI	3.93	.26.4	.875x2.50	4	CS	7 <sup>1</sup> / <sub>2</sub>	31.6	CS	2.00x1.18	2.50x1.75	2.50x2.15	abce	Op	14 mm.	Op	1 <sup>1</sup> / <sub>2</sub>	No	555	22	32 <sup>1</sup> / <sub>2</sub>	34 <sup>1</sup> / <sub>2</sub>	14	
Ch	AI	3.87	.25.6	.875x2.50	4	CS	9 <sup>1</sup> / <sub>2</sub>	40.8	CS	2.50x1.25	3.00x2.56	3.00x2.37	abce	Op	14 mm.	Op	1 <sup>1</sup> / <sub>2</sub>	No	1145	25	35 <sup>1</sup> / <sub>2</sub>	47	15	
Ch	AI	5.68	.59.8	1.18x4.15	5	CS	9	75.5	CS	3.00x1.65	6.00x2.12	6.00x2.12	abce	CH	18 mm.	Str(2)	2	No	2600	38 <sup>3</sup> / <sub>4</sub>	53	89 <sup>1</sup> / <sub>2</sub>	16	
HG	AI	3.68	.22.0	.750x1.87	3	CS	8	30	CS	1.75x1.50	3	1.87x1.56	1.87x1.81	abce	CH	18 mm.	Zen	1 <sup>1</sup> / <sub>2</sub>	No	4805	20	22 <sup>3</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	17
HG	AI	3.68	.22.0	.750x1.87	3	CS	8	30	CS	1.75x1.50	3	1.87x1.56	1.87x1.81	abce	CH	14 mm.	Str	1 <sup>1</sup> / <sub>2</sub>	No	695	20	22 <sup>3</sup> / <sub>4</sub>	38 <sup>1</sup> / <sub>2</sub>	18
Ch	AI	5.68	.59.8	1.18x4.15	5	CS	9	75.5	CS	3.00x1.62	6.00x2.12	6.00x2.12	abce	CH	18 mm.	Str(2)	2	No	2425	33	40	72	19	
Ch	AI	5.68	.59.8	1.18x4.15	5	CS	9	75.5	CS	3.00x1.62	6.00x2.12	6.00x2.12	abce	CH	18 mm.	Str(2)	2	No	2650	33	40	81 <sup>1</sup> / <sub>2</sub>	20	
HG	AI	3.75	.21.1	.875x2.50	3	CS	9 <sup>1</sup> / <sub>2</sub>	37.4	CS	2.12x1.25	2.37x1.93	2.37x1.87	abce	CH	18 mm.	Zen	1 <sup>1</sup> / <sub>2</sub>	No	795	24 <sup>1</sup> / <sub>2</sub>	26	44	21	
HG	AI	3.75	.21.1	.875x2.50	3	CS	9 <sup>1</sup> / <sub>2</sub>	37.4	CS	2.12x1.25	2.37x1.93	2.37x1.87	abce	CH	18 mm.	Zen	1 <sup>1</sup> / <sub>2</sub>	No	840	24 <sup>1</sup> / <sub>2</sub>	26	49 <sup>1</sup> / <sub>2</sub>	22	
HG	AI	3.75	.21.1	.875x2.50	3	CS	9 <sup>1</sup> / <sub>2</sub>	37.4	CS	2.12x1.25	2.37x1.93	2.37x1.87	abce	CH	14 mm.	Zen(3)	1 <sup>1</sup> / <sub>2</sub>	No	655	25 <sup>1</sup> / <sub>2</sub>	28 <sup>1</sup> / <sub>2</sub>	41	23	
HG	AI	3.75	.20.0	.875x2.50	3	CS	9 <sup>1</sup> / <sub>2</sub>	37.4	CS	2.12x1.25	2.37x1.93	2.37x1.87	abce	CH	18 mm.	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	915	25 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	51 <sup>1</sup> / <sub>2</sub>	24	
HG	AI	3.75	.20.0	.875x2.50	3	CS	9 <sup>1</sup> / <sub>2</sub>	37.4	CS	2.12x1.25	2.37x1.93	2.37x1.87	abce	CH	18 mm.	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	1115	25 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	57	25	
HG	AI	4.25	.32.0	1.00x3.18	4	CS	9	45.6	CS	2.34x1.68	2.62x2.53	2.62x2.75	abce	CH	18 mm.	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	1355	27	30	72	27	
HG	AI	4.25	.32.0	1.00x3.18	4	CS	9	45.6	CS	2.34x1.68	2.62x2.53	2.62x2.75	abce	CH	18 mm.	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	501	26	23	39 <sup>1</sup> / <sub>2</sub>	29	
HG	CI	3.56	.859x2.68	4	CS	7			CS	1.93x1.31	2.25x1.18	2.25x1.81	abce	CH	18 mm.	Str	1 <sup>1</sup> / <sub>2</sub>	No	749	18 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	40	29	
HG	AI	4.75	.36.0	1.10x2.90	5	CS	8 <sup>1</sup> / <sub>2</sub>	44.5	CS	2.25x1.56	2.62x2.15	2.62x2.15	abce	CH	18 mm.	Str	1 <sup>1</sup> / <sub>2</sub>	No	738	18 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	40	31	
HG	AI	4.75	.39.0	1.10x3.05	5	CS	8 <sup>1</sup> / <sub>2</sub>	44.5	CS	2.25x1.56	2.62x2.15	2.62x2.15	abce	CH	18 mm.	Str	1 <sup>1</sup> / <sub>2</sub>	No	759	18 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>	40	31	
HG	AI	4.75	.42.6	1.10x3.18	5	CS	8 <sup>1</sup> / <sub>2</sub>	44.5	CS	2.25x1.56	2.62x2.15	2.62x2.15	abce	CH	18 mm.	Str	1 <sup>1</sup> / <sub>2</sub>	No	955	25 <sup>1</sup> / <sub>2</sub>	34 <sup>1</sup> / <sub>2</sub>	45	32	
HG	AI	4.31	.48.5	1.00x3.50	4	AS	11 <sup>1</sup> / <sub>2</sub>	54	CS	2.37x1.62	2.62x1.68	2.62x2.78	abce	CH	18 mm.	Str	1 <sup>1</sup> / <sub>2</sub>	No	97	26 <sup>1</sup> / <sub>2</sub>	34 <sup>1</sup> / <sub>2</sub>	46	33	
HG	CI	5.10	.54.0	1.12x3.62	4	AS	12 <sup>1</sup> / <sub>2</sub>	83	CS	2.50x1.81	3.00x2.25	3.00x3.12	abce	CH	18 mm.	Sch	1	No	1199	27 <sup>1</sup> / <sub>2</sub>	41	50	34	
HG	AI	5.48	.62.0	1.12x3.87	5	AS	12 <sup>1</sup> / <sub>2</sub>	83	CS	2.50x1.81	3.00x2.25	3.00x3.12	abce	CH	18 mm.	Sch	1	No	1209	27 <sup>1</sup> / <sub>2</sub>	41	50	35	
HG	AI	5.75	.68.0	1.43x3.78	5	AS	11 <sup>1</sup> / <sub>2</sub>	100.5	CS	3.00x2.09	3.50x1.68	3.50x2.37	abef	CH	14 mm.	Str	1 <sup>1</sup> / <sub>2</sub>	No	1657	30 <sup>1</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>2</sub>	53 <sup>1</sup> / <sub>2</sub>	37	
HG	AI	5.62	.95.0	1.43x4.00	5	AS	11 <sup>1</sup> / <sub>2</sub>	100.5	CS	3.00x2.09	3.50x1.68	3.50x2.37	abef	CH	14 mm.	Str	2	No	1700	30 <sup>1</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>2</sub>	53 <sup>1</sup> / <sub>2</sub>	38	
HG	CI	4.37	.51.0	1.00x3.00	4	CS	9	54	CS	2.62x1.50	2.95x3.48	2.95x4.25	abce	CH	18 mm.	Sch	1	No	1710	30 <sup>1</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>2</sub>	53 <sup>1</sup> / <sub>2</sub>	39	
HG	CI	5.00	.80.0	1.25x3.87	4	CS	10	98	CS	2.37x2.50	2.50x2.50	2.62x3.50	abce	CH	18 mm.	Sch	1	No	650	191/ <sub>2</sub>	34	34 <sup>1</sup> / <sub>2</sub>	40	
HG	CI	5.00	.80.0	1.25x3.87	4	CS	10	98	CS	2.37x2.50	2.50x2.50	2.62x3.50	abce	CH	18 mm.	Sch	1	No	1240	23 <sup>1</sup> / <sub>2</sub>	43 <sup>1</sup> / <sub>2</sub>	46 <sup>1</sup> / <sub>2</sub>	41	
HG	CI	5.00	.80.0	1.25x3.87	4	CS	10	98	CS	2.37x2.50	2.50x2.50	2.62x3.50	abce	CH	18 mm.	Sch	1	No	1240	23 <sup>1</sup> / <sub>2</sub>	43 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>2</sub>	42	
HG	AI	5.00	.103.0	1.25x4.25	4	CS	12	114	CS	2.37x2.87	2.87x3.87	3.12x5.75	abce	CH	18 mm.	Sch	1	No	1275	22 <sup>1</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>2</sub>	44 <sup>1</sup> / <sub>2</sub>	44	
HG	AI	18.0	.122.0	1.25x6.18	5	AS	15 <sup>1</sup> / <sub>2</sub>	180	CNS	2.55x3.16	2.56x3.48	2.56x4.25	abce	Bos	18 mm.	Hol	2	No	2455	32 <sup>1</sup> / <sub>2</sub>	52 <sup>1</sup> / <sub>2</sub>	73	45	
HG	AI	18.0	.140.0	1.37x5.62	5	AS	1																	

## AMERICAN STOCK, MARINE AND

Line Number	MAKE AND MODEL	Designed for	Number of Cylinders Bore and Stroke (In.)	Rated Hp. (A.M.A.)	Maximum Brake Hp. at Specified R.P.M.	Piston Displacement (Cu. In.)	Compression Ratio	Maximum Torque at R.P.M. (Lb. Ft.)	No. of Cylinders Cast in One Piece	Crankcase - Upper Half Integral with Cylinders	Arrangement	VALVES								
												Exhaust Head Material or S.A.E. No.	Max. Head Diameter (In.)	Min. Port Diameter (In.)	Lift (In.)	Stem Diameter (In.)	Seat Angle (Degrees)			
Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake				
1	Speedway	MP M	6-5 <sup>1</sup> / <sub>2</sub> x 7	190-1300	1090-6	4.30	780-1000	2	Se	Sil	2.50	2.50	2.12	2.50	.562	.531	.531	.45		
2	Speedway	MR M	6-5 <sup>1</sup> / <sub>2</sub> x 7	190-1300	1090-6	4.00	810-800	2	Se	Tun	2.78	2.78	2.25	2.25	.562	.562	.562	.45		
3	Speedway	MC M	6-5 <sup>1</sup> / <sub>2</sub> x 7	260-1800	1090-6	5.00	825-1400	2	Se	Tun	2.50	2.50	2.12	2.50	.562	.531	.531	.45		
4	Speedway	P M	6-6 <sup>1</sup> / <sub>2</sub> x 8 <sup>1</sup> / <sub>2</sub>	115-600	1825-5	3.80	1070-300	2	Se	Sil	2.62	2.62	2.12	2.62	.468	.468	.468	.45		
5	Speedway	R M	6-7 <sup>1</sup> / <sub>2</sub> x 8 <sup>1</sup> / <sub>2</sub>	300-1200	1963-0	4.20	180-800	2	Se	Tun	2.25	2.25	2.43	2.25	.500	.500	.562	.45		
6	Sterling	Neptune D2-12	M, Ind	2-5 <sup>1</sup> / <sub>2</sub> x 7	24.2	15-500	332.6	158-400	2	Se	Sil	2.06	2.06			.375	.375	.437	.45	
7	Sterling	Petrel L-6	M.T.Tr.B.Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6	66.1	115-1230	780-0	4.30	500-	6	Se	Sil	2.25	2.25			.455	.455	.437	.45
8	Sterling	Petrel L-6	M.T.Tr.B.Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6	66.1	145-1500	780-0	4.68	500-1400	6	Se	Sil	2.25	2.25			.455	.455	.437	.45
9	Sterling	Petrel L-6	M.T.Tr.B.Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6	66.1	145-1500	780-0	4.68	500-1400	6	Se	Sil	2.25	2.25			.455	.455	.437	.45
10	Sterling	Petrel L-6	M.T.Tr.B.Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6	66.1	180-1800	780-0	5.00	500-1400	6	Se	Sil	2.25	2.25			.455	.455	.437	.45
11	Sterling	Petrel Reduction L	M.T.Tr.B.Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6	66.1	175-1800	780-0	4.68	500-1400	6	Se	L	2.25	2.25			.455	.455	.437	.45
12	Sterling	Petrel L-6	M.T.Tr.B.Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6	66.1	200-2000	780-0	5.54	500-1400	6	Se	Sil	2.25	2.25			.455	.455	.437	.45
13	Sterling	Petrel L-6	M.T.Tr.B.Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6	66.1	225-2200	780-0	5.50	500-1400	6	Se	L	2.25	2.25			.455	.455	.437	.45
14	Sterling	Chevron 6	Tr. M, Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	72.6	85-800	962.0		590-1200	2	Se	T	2.25	2.25			.375	.375	.500	.45
15	Sterling	Chevron 6	Tr. M, Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	72.6	130-1200	962.0		590-1200	2	Se	T	2.25	2.25			.375	.375	.500	.45
16	Sterling	Chevron 6	Tr. M, Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	72.6	150-1500	962.0		590-1200	2	Se	T	2.25	2.25			.375	.375	.500	.45
17	Sterling	Dolphin-Med. GRM-6	Tr. M, Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	79.3	165-1200	1051.6	3.85	785-1200	2	Se	Sil	1.87	1.87			.375	.375	.437	.60
18	Sterling	Dolphin 6-GR-6	Tr. M, Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	79.3	225-1550	1051.6	4.08	785-1200	2	Se	Sil	1.87	1.87			.375	.375	.437	.60
19	Sterling	Dolphin 6-GRS-6	Tr. M, Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	79.3	300-2000	1051.6	4.70	785-1200	2	Se	Sil	1.87	1.87			.375	.375	.437	.60
20	Sterling	Coast Guard M-6	Tr. M, Ind	6-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	93.7	225-1200	1426.8	4.13	986-1200	W	Se	Sil	1.87	1.87			.483	.483	.437	.60
21	Sterling	Coast Guard 6-M-6	Tr. M, Ind	6-5 <sup>1</sup> / <sub>2</sub> x 7 <sup>3</sup> / <sub>4</sub>	93.7	300-1550	1426.8	4.13	986-1200	W	Se	Sil	1.87	1.87			.483	.483	.437	.60
22	Sterling	Viking II T-6	Tr. M, Ind	6-8 <sup>1</sup> / <sub>2</sub> x 9	153.6	190-600	2714.3	3.93	1900-1000	W	Se	C	2.59	2.59			.555	.556	.562	.45
23	Sterling	Viking II T-6	Tr. M, Ind	6-8 <sup>1</sup> / <sub>2</sub> x 9	153.6	300-900	2714.3	4.18	1900-1000	W	Se	C	2.59	2.59			.555	.556	.562	.45
24	Sterling	Viking II T-6	Tr. M, Ind	6-8 <sup>1</sup> / <sub>2</sub> x 9	153.6	425-1200	2714.3	4.18	1900-1000	W	Se	C	2.59	2.59			.555	.556	.562	.45
25	Sterling	Dolphin-Med. GRM-6	Tr. M, Ind	8-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	105.8	220-1200	1402.2	3.85	1055-1300	2	Se	Sil	1.87	1.87			.375	.375	.437	.60
26	Sterling	Dolphin 8-GR-8	Tr. M, Ind	8-5 <sup>1</sup> / <sub>2</sub> x 6 <sup>3</sup> / <sub>4</sub>	105.8	300-1550	1402.2	4.08	1055-1300	2	Se	Sil	1.87	1.87			.375	.375	.437	.60
27	Sterling	Viking II 8-T-8	Tr. M, Ind	8-8 <sup>1</sup> / <sub>2</sub> x 9	204.8	250-600	3619.0	3.93	2520-1050	W	Se	C	2.59	2.59			.555	.556	.562	.45
28	Sterling	Viking II 8-T-8	Tr. M, Ind	8-8 <sup>1</sup> / <sub>2</sub> x 9	204.8	400-900	3619.0	4.18	2520-1050	W	Se	C	2.59	2.59			.556	.556	.562	.45
29	Sterling	Viking II 8-T-8	Tr. M, Ind	8-8 <sup>1</sup> / <sub>2</sub> x 9	204.8	565-1200	3619.0	4.18	2520-1050	W	Se	C	2.59	2.59			.555	.556	.562	.45
30	Thorobred	K M		1-3 <sup>1</sup> / <sub>2</sub> x 4 <sup>1</sup> / <sub>2</sub>	5-1005	52.5	4.00		1	Se	Cl	1.62	1.62	1.43	1.43	.300	.300	.375	.45	
31	Thorobred	KK M		2-3 <sup>1</sup> / <sub>2</sub> x 4 <sup>1</sup> / <sub>2</sub>	10-1100	105.0	4.00		2	Se	L	1.62	1.62	1.43	1.43	.300	.300	.375	.45	
32	Thorobred	Meteor M		4-2 <sup>1</sup> / <sub>2</sub> x 3 <sup>1</sup> / <sub>2</sub>	18-2800	61.0	5.70		4	Se	CHS	1.12	1.97	1.00	812	.228	.250	.312	.45	
33	Thorobred	DS M		4-2 <sup>1</sup> / <sub>2</sub> x 4	16-1800	95.0	4.66		4	In	L	1.46	1.34	1.31	1.04	.250	.250	.312	.45	
34	Thorobred	Arrowhead Jr. M		4-3 <sup>1</sup> / <sub>2</sub> x 4	35-2500	133.0	5.60		4	In	CHS	1.34	1.34	1.04	1.04	.281	.281	.312	.45	
35	Thorobred	Arrowhead M		4-3 <sup>1</sup> / <sub>2</sub> x 4 <sup>1</sup> / <sub>2</sub>	42-2250	186.0	4.70		4	In	Sil	1.56	1.56	1.37	1.37	.302	.302	.375	.45	
36	Thorobred	AA M		4-3 <sup>1</sup> / <sub>2</sub> x 4 <sup>1</sup> / <sub>2</sub>	24-1400	210.0	4.00		2	Se	L	1.62	1.62	1.43	1.43	.300	.300	.375	.45	
37	Thorobred	F M		4-4 <sup>1</sup> / <sub>2</sub> x 5	36-1400	259.0	4.00		2	Se	Cl	1.93	1.93	1.75	1.75	.300	.300	.375	.45	
38	Thorobred	B M		4-4 <sup>1</sup> / <sub>2</sub> x 5	44-1800	318.0	4.00		4	Se	DC	2.09	2.09	1.93	1.93	.300	.300	.375	.45	
39	Thorobred	BS-4 M		4-4 <sup>1</sup> / <sub>2</sub> x 6	56-1600	382.0	4.00		4	Se	DC	2.34	2.34	2.12	2.12	.300	.300	.375	.45	
40	Thorobred	BC-4 M		4-5 <sup>1</sup> / <sub>2</sub> x 7	56-1200	550.0	4.00		2	Se	L	2.75	2.75	2.37	2.37	.375	.375	.625	.45	
41	Thorobred	BCS-4 M		4-5 <sup>1</sup> / <sub>2</sub> x 7	71-1100	727.0	4.00		2	Se	L	2.75	2.75	2.37	2.37	.375	.375	.625	.45	
42	Thorobred	BC-Super-4		4-6 <sup>1</sup> / <sub>2</sub> x 7	78-1100	792.0	4.00		2	Se	L	2.75	2.75	2.37	2.37	.375	.375	.625	.45	
43	Thorobred	Hiawatha M		6-3 <sup>1</sup> / <sub>2</sub> x 4 <sup>1</sup> / <sub>2</sub>	84-3000	282.0	5.70		6	In	Sil	1.68	1.68	1.50	1.50	.375	.375	.45	.45	
44	Thorobred	Arrow Super-6		6-4 <sup>1</sup> / <sub>2</sub> x 4 <sup>1</sup> / <sub>2</sub>	90-2200	404.0	5.70		6	In	Sil	1.87	1.87	1.62	1.62	.312	.312	.375	.45	
45	Thorobred	BB-6 M		6-5 <sup>1</sup> / <sub>2</sub> x 6	101-1500	707.0	4.00		6	Se	DC	2.34	2.34	2.12	2.12	.300	.300	.375	.45	
46	Thorobred	BBS-6 M		6-5 <sup>1</sup> / <sub>2</sub> x 6	112-1100	1091.0	4.00		2	Se	CAI	2.75	2.75	2.37	2.37	.375	.375	.625	.45	
47	Thorobred	BC-6 M		6-5 <sup>1</sup> / <sub>2</sub> x 7	124-1100	1187.5	4.00		2	Se	CAI	2.75	2.75	2.37	2.37	.375	.375	.625	.45	
48	Thorobred	BC-Super-6 M		6-5 <sup>1</sup> / <sub>2</sub> x 7	8-1200	67.6	4.60		1	In	CNS	1.87	1.87			.250	.250	.375	.45	
49	Thorobred	Universal W		2-3 <sup>1</sup> / <sub>2</sub> x 4 <sup>1</sup> / <sub>2</sub>	10-2000	49.5	5.75		2	In	CNS	1.50	1.50			.234	.234	.312	.45	
50	Universal	AFT M		4-3 <sup>1</sup> / <sub>2</sub> x 4	25-2500	85.0	5.00		4	In	Sil	1.50	1.50			.312	.312	.375	.45	
51	Universal	BN M		4-3 <sup>1</sup> / <sub>2</sub> x 4	40-3500	99.0	6.00		4	In	CNS	1.37	1.37			.312	.312	.375	.45	
52	Universal	AF M		4-3 <sup>1</sup> / <sub>2</sub> x 4	50-3000	149.3	5.70		4	In	Sil	1.50								

## COMMERCIAL VEHICLE ENGINES—continued

Front End Drive—Type	PISTONS				CONNECTING RODS				CRANKSHAFT				Oil Pressure To	Recommended Make	SPARK PLUG	CARBUR-ETOR	OVERALL DIMENSIONS (In.)								
	Material	Length (In.)	Weight (with Pins, Rings and Bushing) (Oz.)	Piston Pin—Diameter and Length (In.)	Number of Rings per Piston		Material	Center to Center Length (In.)	Weight—With Bushing and Cap (Oz.)	Material	Counterbalances Used	Crank-pin	Diameter and Length (In.)	Number	Front	Rear									
					Material	Center to Center Length (In.)																			
HG	CI	6.25	1.37x5.37	4	AS	15 <sup>1</sup> / <sub>2</sub>	CNS	N	2.62x3.00	7	2.62x3.00	2.62x3.00	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	2	No	2025	29 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>2</sub>	88 <sup>1</sup> / <sub>2</sub>	1		
HG	CI	6.25	1.37x5.37	4	AS	15 <sup>1</sup> / <sub>2</sub>	CNS	N	2.62x3.00	7	2.62x3.00	2.62x3.00	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	2	No	2200	28	45 <sup>1</sup> / <sub>2</sub>	88 <sup>1</sup> / <sub>2</sub>	2		
HG	AI	6.12	84.8	1.37x5.37	6	AS	20	CNS	N	2.87x3.62	7	2.87x3.62	2.87x3.62	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	2	No	2100	27 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>2</sub>	88 <sup>1</sup> / <sub>2</sub>	3	
HG	CI	8.25	1.62x6.37	4	AS	19	CNS	N	3.50x4.12	7	3.50x4.12	3.50x4.12	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	2	No	4800	38 <sup>1</sup> / <sub>2</sub>	48 <sup>1</sup> / <sub>2</sub>	103 <sup>1</sup> / <sub>2</sub>	4		
HG	CI	7.00	1.87x5.50	4	AS	19	CNS	N	2.25x2.62	3	2.25x2.62	2.25x4.75	Splash	CH	3 <sup>1</sup> / <sub>2</sub> -18	Hol(2)	2	No	4000	36	55 <sup>1</sup> / <sub>2</sub>	111 <sup>1</sup> / <sub>2</sub>	5		
HG	CI	6.00	140.0	1.25x5.12	4	CS	12 <sup>1</sup> / <sub>2</sub>	96	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Sch	1 <sup>1</sup> / <sub>2</sub>	No	1100	24	36 <sup>1</sup> / <sub>2</sub>	53 <sup>1</sup> / <sub>2</sub>	6
HG	AI	5.50	94.0	1.43x4.37	4	CS	12 <sup>1</sup> / <sub>2</sub>	113	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	1400	27 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	71 <sup>1</sup> / <sub>2</sub>	7
HG	AI	5.50	94.0	1.43x4.37	4	CS	12 <sup>1</sup> / <sub>2</sub>	113	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	1400	27 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	71 <sup>1</sup> / <sub>2</sub>	8
HG	AI	5.50	94.0	1.43x4.37	4	CS	12 <sup>1</sup> / <sub>2</sub>	113	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	1850	27 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	71 <sup>1</sup> / <sub>2</sub>	9
HG	AI	5.50	94.0	1.43x4.37	4	CS	12 <sup>1</sup> / <sub>2</sub>	113	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	1400	27 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	71 <sup>1</sup> / <sub>2</sub>	10
HG	AI	5.50	94.0	1.43x4.37	4	CS	12 <sup>1</sup> / <sub>2</sub>	113	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2000	27 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	81 <sup>1</sup> / <sub>2</sub>	11
HG	AI	5.50	94.0	1.43x4.37	4	CS	12 <sup>1</sup> / <sub>2</sub>	113	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2000	27 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	71 <sup>1</sup> / <sub>2</sub>	12
HG	AI	5.50	94.0	1.43x4.37	4	CS	12 <sup>1</sup> / <sub>2</sub>	113	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2000	27 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	71 <sup>1</sup> / <sub>2</sub>	13
HG	CI	6.00	140.0	1.25x5.12	4	CS	12 <sup>1</sup> / <sub>2</sub>	113	CNS	Y	2.50x2.12	7	3.00x1.75	3.00x2.87	abcdef	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2000	30 <sup>1</sup> / <sub>2</sub>	35 <sup>1</sup> / <sub>2</sub>	87 <sup>1</sup> / <sub>2</sub>	14
HG	CI	6.00	140.0	1.25x5.12	5	CS	14	130	CNS	Y	2.50x3.00	4	2.50x4.43	2.50x4.43	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2000	30 <sup>1</sup> / <sub>2</sub>	35 <sup>1</sup> / <sub>2</sub>	87 <sup>1</sup> / <sub>2</sub>	15
HG	CI	6.00	140.0	1.25x5.12	5	CS	14	130	CNS	Y	2.50x3.00	4	2.50x4.43	2.50x4.43	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2000	30 <sup>1</sup> / <sub>2</sub>	35 <sup>1</sup> / <sub>2</sub>	87 <sup>1</sup> / <sub>2</sub>	16
HG	AI	5.81	100.0	1.25x5.12	3	CS	14	130	CNS	Y	2.50x3.00	4	2.50x4.43	2.50x4.43	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2250	30 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>2</sub>	87 <sup>1</sup> / <sub>2</sub>	17
HG	AI	6.08	100.0	1.25x5.12	3	CS	14	130	CNS	Y	2.50x3.00	4	2.50x4.43	2.50x4.43	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2000	30 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>2</sub>	87 <sup>1</sup> / <sub>2</sub>	18
HG	AI	6.46	110.0	1.25x5.12	3	CS	14	130	CNS	Y	2.50x3.00	4	2.50x4.43	2.50x4.43	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(2)	1 <sup>1</sup> / <sub>2</sub>	No	2175	30 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>2</sub>	87 <sup>1</sup> / <sub>2</sub>	19
HG	AI	6.08	125.0	1.50x5.37	4	CS	14 <sup>1</sup> / <sub>2</sub>	224	CNS	Y	3.00x3.12	7	3.25x2.62	3.25x3.68	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	SZ(2)	2 <sup>1</sup> / <sub>2</sub>	No	4000	31	49 <sup>1</sup> / <sub>2</sub>	102	20
HG	AI	6.42	129.0	1.50x5.37	4	CS	14 <sup>1</sup> / <sub>2</sub>	224	CNS	Y	3.00x3.12	7	3.25x2.62	3.25x3.68	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	SZ(2)	2 <sup>1</sup> / <sub>2</sub>	No	3400	31	49 <sup>1</sup> / <sub>2</sub>	102	21
HG	AI	8.00	280.0	2.00x7.00	4	CS	18	416	CNS	Y	4.00x3.12	7	4.00x3.37	4.00x5.50	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(3)	2 <sup>1</sup> / <sub>2</sub>	No	7100	40 <sup>1</sup> / <sub>2</sub>	72 <sup>1</sup> / <sub>2</sub>	121 <sup>1</sup> / <sub>2</sub>	22
HG	AI	8.25	290.0	2.00x7.00	4	CS	18	416	CNS	Y	4.00x3.12	7	4.00x3.37	4.00x5.50	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(3)	2 <sup>1</sup> / <sub>2</sub>	No	7100	40 <sup>1</sup> / <sub>2</sub>	72 <sup>1</sup> / <sub>2</sub>	121 <sup>1</sup> / <sub>2</sub>	23
HG	AI	8.93	290.0	2.00x7.00	4	CS	18	416	CNS	Y	4.00x3.12	7	4.00x3.37	4.00x5.50	abcde	CH	7 <sup>1</sup> / <sub>2</sub> -18	Zen(4)	2 <sup>1</sup> / <sub>2</sub>	No	9000	40 <sup>1</sup> / <sub>2</sub>	72 <sup>1</sup> / <sub>2</sub>	142 <sup>1</sup> / <sub>2</sub>	28
HG	CI	4.12	64.0	1.10x3.25	3	CS	8 <sup>1</sup> / <sub>2</sub>	43	CS	N	1.50x2.12	2	1.50x3.00	1.50x3.00	Splash	AC	7 <sup>1</sup> / <sub>2</sub> -18	K	1	K	415	19 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub>	36 <sup>1</sup> / <sub>2</sub>	31
HG	CI	4.12	64.0	1.10x3.25	3	CS	8 <sup>1</sup> / <sub>2</sub>	43	CS	N	1.50x2.12	2	1.50x3.00	1.50x3.00	Splash	AC	7 <sup>1</sup> / <sub>2</sub> -18	Str	1	K	240	18 <sup>1</sup> / <sub>2</sub>	19 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	32
HG	AI	2.37	10.0	0.625x2.12	3	CS	6	14	CS	N	1.43x1.25	24	ND1207x1	ND1207x1	ce	AC	14 mm.	Zen	5 <sup>1</sup> / <sub>2</sub>	No	330	15 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>2</sub>	38 <sup>1</sup> / <sub>2</sub>	33
HG	CI	3.00	19.0	0.625x2.40	3	CS	8	27	CS	N	1.75x1.50	2	1.76x2.81	1.73x2.87	abcde	AC	7 <sup>1</sup> / <sub>2</sub> -18	Str	1	K	490	21 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>2</sub>	35	34
HG	CI	3.50	30.0	0.875x2.62	3	CS	7 <sup>1</sup> / <sub>2</sub>	29	CS	N	1.75x1.25	3	2.12x1.43	2.12x1.43	abcde	AC	18 mm.	Str	1	K	610	19 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	41 <sup>1</sup> / <sub>2</sub>	41
HG	CI	3.93	45.0	1.10x3.06	4	CS	8 <sup>1</sup> / <sub>2</sub>	46	CS	N	2.00x1.50	3	2.00x2.50	2.00x2.87	abcde	AC	7 <sup>1</sup> / <sub>2</sub> -18	Str	1	K	620	19 <sup>1</sup> / <sub>2</sub>	22 <sup>1</sup> / <sub>2</sub>	46 <sup>1</sup> / <sub>2</sub>	36
HG	CI	4.75	69.0	1.10x3.06	4	CS	8 <sup>1</sup> / <sub>2</sub>	66	CS	N	2.00x2.25	3	2.00x4.18	2.00x5.50	abcde	AC	7 <sup>1</sup> / <sub>2</sub> -18	Str	1	K	830	20 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	54 <sup>1</sup> / <sub>2</sub>	37
HG	CI	4.75	89.0	1.10x3.06	4	CS	8 <sup>1</sup> / <sub>2</sub>	66	CS	N	2.00x2.25	3	2.00x4.18	2.00x5.50	abcde	AC	7 <sup>1</sup> / <sub>2</sub> -18	Str	1	K	830	20 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	54 <sup>1</sup> / <sub>2</sub>	38
HG	CI	5.25	82.0	1.25x3.87	4	CS	11 <sup>1</sup> / <sub>2</sub>	87	CS	N	2.56x2.25	5	2.56x4.25	2.56x4.25	abcde	AC	7 <sup>1</sup> / <sub>2</sub> -18	Str	2	K	1175	22 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	58 <sup>1</sup> / <sub>2</sub>	39
HG	CI	6.00	126.0	1.43x4.68	4	CS	13 <sup>1</sup> / <sub>2</sub>	168	CS	N	2.58x3.00	5	2.62x4.50	2.62x4.50	abcde	AC	7 <sup>1</sup> / <sub>2</sub> -18	Str	2	K	1720	25 <sup>1</sup> / <sub>2</sub>	35 <sup>1</sup> / <sub>2</sub>	74 <sup>1</sup> / <sub>2</sub>	40
HG	CI	6.00	150.0	1.43x5.25	4	CS	13 <sup>1</sup> / <sub>2</sub>	168	CS	N	2.58x3.00	5	2.62x4.50	2.62x4.50	abcde	AC	7 <sup>1</sup> / <sub>2</sub> -18	Str	2	K	1730	25 <sup>1</sup> / <sub>2</sub>	35 <sup>1</sup> / <sub>2</sub>	74 <sup>1</sup> / <sub>2</sub>	41
HG	CI	6.00																							

## AMERICAN STOCK, MARINE AND

Line Number	MAKE AND MODEL	Designed for	Number of Cylinders Bore and Stroke (In.)	Rated Hp. (A.M.A.)	Maximum Brake Hp. at Specified R.P.M.	Piston Displacement (Cu. In.)	Compression Ratio	Maximum Torque at R.P.M. (Lb. Ft.)	No. of Cylinders Cast in One Piece	Crankcase, Upper Half Integrated with Cylinders	Arrangement	VALVES					
												Max. Head Diameter (In.)	Min. Port Diameter (In.)	Lift (In.)	Stem Diameter (In.)	Seat Angle (Degrees)	
Intake	Exhaust	Intake	Exhaust	Intake	Exhaust												
1 Wisconsin	AM-4	Tr, Ind	4-3 $\frac{1}{4}$ x 4	16.9	28-2230	132.0	4.60	79-1301	4	Sc	Sil	1.50	1.37	1.31	1.18	.276	.256 .312 .312 .312 45
2 Wisconsin	AP-4	Tr, Ind	4-3 $\frac{1}{4}$ x 4	19.6	31-2230	154.0	4.60	96-1100	4	Se	Sil	1.50	1.37	1.31	1.18	.276	.256 .312 .312 .312 45
3 Wisconsin	SU	T, Ind	4-4x5	25.6	38-1600	154.0	4.20	160-1000	4	In	Sil	1.68	1.53	1.43	1.33	.379	.375 .375 .375 .375 45
4 Wisconsin	W	T, Tr, Ind	4-4 $\frac{1}{2}$ x 5	27.2	42-1600	267.0	4.15	182-950	4	In	Sil	1.68	1.68	1.53	1.43	.379	.375 .375 .375 .375 45
5 Wisconsin	X	T, Tr, Ind	4-4 $\frac{1}{2}$ x 5	32.4	66-1900	318.0	4.25	224-1000	4	In	Sil	2.00	2.00	1.81	1.51	.394	.393 .437 .437 .437 45
6 Wisconsin	N	T, Tr	6-3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	29.4	55-2600	250.0	4.50	163-650	6	In	Sil	1.65	1.65	1.50	1.382	.382	.375 .375 .375 .375 45
7 Wisconsin	GA-1	T, Tr, Ind	6-3 $\frac{1}{2}$ x 5	31.5	44-1600	309.0	4.85	196-675	6	In	Sil	1.71	1.71	1.50	1.30	.379	.375 .375 .375 .375 45
8 Wisconsin	GA-2	T, Tr, Ind	6-3 $\frac{1}{2}$ x 5	33.7	49-1600	331.0	4.50	211-700	6	In	Sil	1.71	1.71	1.50	1.30	.379	.375 .375 .375 .375 45
9 Wisconsin	L-2	T, Tr, Ind	6-3 $\frac{1}{2}$ x 5	36.0	62-1800	354.0	4.27	236-700	6	In	Sil	2.00	2.00	1.75	1.50	.379	.375 .375 .375 .375 45
10 Wisconsin	L-3	T, Tr, Ind	6-4 $\frac{1}{2}$ x 5	40.8	68-1800	401.0	4.30	260-700	6	In	Sil	2.00	2.00	1.75	1.50	.379	.375 .375 .375 .375 45
11 Wisconsin	L-4	T, Ind	6-4 $\frac{1}{2}$ x 5	43.3	71-1800	425.0	4.26	280-650	6	In	Sil	2.00	2.00	1.75	1.50	.379	.375 .375 .375 .375 45
12 Wisconsin	ZA-1	Tr, Ind	6-4 $\frac{1}{2}$ x 5	48.6	78-1600	477.0	4.50	322-800	6	Se	Sil	2.25	2.25	2.06	1.86	.450	.450 .437 .437 .437 45
13 Wisconsin	ZA-2	Tr, Ind	6-4 $\frac{1}{2}$ x 5	51.3	82-1600	504.0	4.88	340-750	6	Se	Sil	2.25	2.25	2.06	1.86	.450	.450 .437 .437 .437 45

## ABBREVIATIONS

★—Also made in 4 cylinder model  
†—Intake, Tungsten Steel, Exhaust, Silchrome Steel  
§—Weight complete  
\*—Pressure stream to Connecting Rods and Timing Gears  
\*\*—Pressure also to Camshaft Thrust Bearing  
■—Also available in reduction gear models  
▼—Also available in R. H. rotation  
‡—Tocco hardened  
◆—Ball Bearings used  
‡—Cast Iron Pistons also supplied

★—Also made in 4 cylinder model

†—Weight per pair

(1)—Liners use in cylinders

(2)—Two used (3)—Three used

(4)—Four used

(5)—Natural gas fuel equipment, or combination natural gas and gasoline equipment available

(6)—Also built in 4 and 6 cylinder models

a—Main Bearings

(aa)—Forked Rod, 88 oz., Plain Rod 50 oz.

b—Connecting Rod Bearings

(bb)—Master Rod and Pin, 163 oz., Link Rod, 55 oz.

B—Buses

Bos—Bosch Spark Plug

B—Ti-Ball or Timken Roller Bearings

c—Camshaft Bearings

C—Cars

CA—Champion or AC Spark Plugs

CA—Champion or AC Spark Plugs

CAI—Champion Aluminum

Ala—Aluminum Alloy, anodized

Ais—Aluminum Alloy with Steel Strut

AS—Alloy Steel

Au—Auto-Lite

AUS—Austenitic Steel

b—Connecting Rod Bearings

(bb)—Master Rod and Pin, 163 oz., Link Rod, 55 oz.

B—Buses

BG—Bevel Gear

Bos—Bosch Spark Plug

B—Ti-Ball or Timken Roller Bearings

c—Camshaft Bearings

C—Cars

CA—Champion or AC Spark Plugs

CAI—Champion Aluminum

Car—Carter Carburetor

CAS—Cast Alloy Steel

Ch—Chain

CH—Champion Spark Plug

CHS—Chrome Nickel Silicon Steel

CI—Cast Iron

CIA—Cast Iron Anodized

CNS—Chrome Nickel Steel

CNT—Chrome Nickel Steel with Tungsten

CS—Carbon Steel

CT—Cast Iron, Tin Plated

CV—Chrome Vanadium

d—Wrist Pins

D—Distillate

DC—Diachrome

## AMERICAN TWO-CYCLE OUTBOARD MOTORS

MAKE AND MODEL	Power Head	No. of Cylinders	Bore and Stroke (In.)	Piston Displacement (Cu. In.)	N.O.A. Certified Brake Hp.	R.P.M.	Weight (Lb.)	Piston Rings No. and Size	Propeller Diameter and Pitch (In.)	Starting Device	Fuel Tank Capacity (Gal.)	Gear Ratio	Ignition System Type	Carburetor Make and Size	Spark Plug Make and Model	Type of Exhaust	Cooling System	
Intake	Exhaust	Intake	Exhaust	Intake	Exhaust													
Clark Troller	T-39 Single	1	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	2.65				2- $\frac{3}{4}$	5 $\frac{1}{2}$ x 4 $\frac{1}{4}$	Cord	0.25					Ch-V-1		
Clark Troller	TT-39 Twin	2	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	5.30				2- $\frac{3}{4}$	6x5	Cord	0.31					Ch-V-1	(a)	
Eclipse (1)	SMD	1	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	5.00	2.25	3300	27.0	2- $\frac{3}{4}$	7 $\frac{1}{2}$ x 5	Cord	0.57	12-19				Ch-J10	Air	
Eclipse (1)	TMD	2	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	10.00	4.50	4000	41.0	3- $\frac{1}{2}$	8 $\frac{1}{2}$ x 6	Cord	0.95	12-19				Ch-J10	Air	
Eito (2)	CUB	1	1 $\frac{1}{2}$ x 1	1.00	.50	4000	9.0	2- $\frac{3}{4}$	5 $\frac{1}{2}$ x 4 $\frac{1}{4}$	Cord	0.12	12-25				Ch-Magneto	Pump	
Eito (2)	PAL	1	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	2.00	1.10	3750	14.0	2- $\frac{3}{4}$	6x5	Cord	0.20	13-20				Ch-Magneto	Pump	
Eito (2)	ACE	1	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	3.75	1.80	3500	23.0	2- $\frac{3}{4}$	7x6	Cord	0.43	13-20				Ch-C	Pump	
Eito (2)	Handitwin	2	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	6.60	3.00	3500	32.0	2- $\frac{3}{4}$	7 $\frac{1}{2}$ x 6	Cord	0.43	13-20				Ch-C	Pump	
Eito (2)	Lightwin	2	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	10.00	5.00	3500	40.0	2- $\frac{3}{4}$	7 $\frac{1}{2}$ x 8	Cord	0.50	11-17				Ch-M6	Pump	
Eito (2)	Fleetwin	2	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	15.00	8.50	4000	66.0	2- $\frac{3}{4}$	9x8 $\frac{1}{4}$	Cord	1.12	13-19				Ch-M7	Pump	
Evinrude	Mate	Ch.V-2 Port	1	1 $\frac{1}{2}$ x 1	1.00	.50	4000	10.0	2- $\frac{3}{4}$	5 $\frac{1}{2}$ x 4 $\frac{1}{4}$	Cord	0.12	12-25				Ch-Magneto	Underwater Pump
Evinrude	Ranger	Ch.V-2 Port	1	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	2.00	1.10	3750	16.0	2- $\frac{3}{4}$	6x5	Cord	0.50	13-20				Ch-Magneto	Underwater Pump
Evinrude	Sportman	Ch.V-2 Port	1	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	3.75	2.00	3500	25.0	2- $\frac{3}{4}$	7x6	Cord	0.50	13-20				Ch-J8	Underwater Pump
Evinrude	Sportwin	Ch.V-2 Port	2	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	6.60	3.30	3500	35.0	2- $\frac{3}{4}$	7 $\frac{1}{2}$ x 6	Cord	0.75	13-20				Ch-J8	Underwater Pump
Evinrude	Fisherman	Ch.V-2 Port	2	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	10.00	5.40	3500	45.0	2- $\frac{3}{4}$	7 $\frac{1}{2}$ x 8	Cord	0.75	13-20				Ch-M6	Underwater Pump
Evinrude	weedless Fish'n	Ch.V-2 Port	2	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	10.00	5.40	3500	48.0	2- $\frac{3}{4}$	7 $\frac{1}{2}$ x 8	Cord	0.75	13-20				Ch-M6	Underwater Pump
Evinrude	Lightfour	RV-2 Port	4	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	15.00	9.30	4000	80.0	3- $\frac{1}{2}$	8 $\frac{1}{2}$ x 9	Cord	1.25	11-17				Ch-Magneto	Underwater Pump
Evinrude	Sportfour	RV-2 Port	4	2 $\frac{1}{2}$ x 2	25.00	16.20	4000	95.0	3- $\frac{1}{2}$	9 $\frac{1}{2}$ x 9 $\frac{1}{2}$	Cord	2.00	13-19				Ch-Magneto	Underwater Pump
Evinrude	Speeditwin	RV-2 Port	2	2 $\frac{1}{2}$ x 2 $\frac{1}{2}$	30.00	22.50	4000	110.0	2- $\frac{3}{4}$	10 $\frac{1}{2}$ x 10 $\frac{1}{2}$	Cord	2.50	15-21				Ch-Magneto	Underwater Pump
Evinrude	Speedifour	RV-2 Port	4	2 $\frac{1}{2}$ x 2 $\frac{1}{2}$	50.00	33.40	4000	140.0	2- $\frac{3}{4}$	10 $\frac{1}{2}$ x 13	Cord	4.00	15-21				Ch-M5	Underwater Pump
Evinrude	Midgit Racer	RV-2 Port	2	1 $\frac{1}{2}$ x 1 $\frac{1}{2}$	7.50	6.00	5000	37.5	3- $\frac{1}{2}$	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$	Cord	1.25	13-20				Ch-R1	Muffler Pump
Evinrude	Racing Speediwin	RV-2 Port	2	2 $\frac{1}{2}$ x 2 $\frac{1}{2}$	30.00	—	—	97.0	2- $\frac{3}{4}$	9 $\frac{1}{2}$ x 14	Cord	2.50	13-19				Ch-R11S	Open Stacks Pump
Evinrude	Racing 460	RV-2 Port	4	2<														

## COMMERCIAL VEHICLE ENGINES—concluded

Front End Drive Type	PISTONS				CONNECTING RODS		CRANKSHAFT				Oil Pressure To	Recommended Make	SPARK PLUG	CARBURETOR	OVERALL DIMENSIONS (In.)									
	Material	Length (In.)	Weight (with Pins, Rings and Bushing) (Oz.)				Material	Center to Center Length (In.)	Weight—With Bushing and Cap (Oz.)	Main Bearings					Number	Front	Rear							
			Piston Pin—Diameter and Length (In.)	Number of Rings per Piston						Crank-pin	Diameter and Length (In.)													
HG	AI	3.75	.937x2.62	4	CS	8 <sup>3</sup> / <sub>8</sub>	CS	Y	1.75x1.25	3	Tim	Tim	ag	CH	18 mm.	Zen	1	No	440	20	29	36 <sup>1</sup> / <sub>2</sub>	1	
HG	AI	3.75	.937x2.67	4	CS	8 <sup>3</sup> / <sub>8</sub>	CS	Y	1.75x1.25	3	Tim	Tim	abcdeg	CH	18 mm.	Zen	1 <sup>1</sup> / <sub>2</sub>	No	440	20	29	36 <sup>1</sup> / <sub>2</sub>	2	
HG	CI	4.25	49.7	1.06x3.47	3	CS	10 <sup>1</sup> / <sub>2</sub>	64	CS	2.00x2.00	3	1.93x2.50	2.05x3.00	abcdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	615	25 <sup>3</sup> / <sub>4</sub>	34 <sup>1</sup> / <sub>2</sub>	35 <sup>1</sup> / <sub>2</sub>	3
HG	CI	4.15	50.2	1.06x3.47	3	CS	10 <sup>1</sup> / <sub>2</sub>	65	CS	2.37x2.00	3	2.37x2.50	2.37x3.00	abcdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	640	25 <sup>3</sup> / <sub>4</sub>	34 <sup>1</sup> / <sub>2</sub>	35 <sup>1</sup> / <sub>2</sub>	4
HG	CI	4.75	117.7	1.18x3.93	5	CS	10 <sup>1</sup> / <sub>2</sub>	118.7	CS	2.75x2.50	3	2.75x3.00	2.75x3.00	abcdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	850	25 <sup>3</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>2</sub>	5
HG	CI	4.00	43.7	1.06x2.84	3	CS	8	54	CS	2.25x1.75	4	2.25x2.50	2.25x3.00	abdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	820	25 <sup>3</sup> / <sub>4</sub>	32 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>2</sub>	6
HG	CI	4.00	48.0	1.06x3.09	3	CS	10 <sup>1</sup> / <sub>2</sub>	68	CS	2.50x1.75	4	2.50x2.50	2.50x3.00	abdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	955	25 <sup>3</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>2</sub>	7
HG	CI	3.90	53.0	1.06x3.09	3	CS	10 <sup>1</sup> / <sub>2</sub>	68	CS	2.50x1.75	4	2.50x2.50	2.50x3.00	abdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	975	25 <sup>3</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>2</sub>	8
HG	CI	4.87	66.0	1.25x3.14	3	CS	10 <sup>1</sup> / <sub>2</sub>	75	CS	2.62x1.75	4	2.75x2.5	2.75x2.75	abdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	1075	25 <sup>3</sup> / <sub>4</sub>	37 <sup>1</sup> / <sub>2</sub>	53 <sup>1</sup> / <sub>2</sub>	9
HG	CI	4.71	71.0	1.25x3.39	4	CS	10 <sup>1</sup> / <sub>2</sub>	75	CS	2.62x1.75	4	2.75x2.25	2.75x2.75	abdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	1095	25 <sup>3</sup> / <sub>4</sub>	37 <sup>1</sup> / <sub>2</sub>	53 <sup>1</sup> / <sub>2</sub>	10
HG	CI	4.62	80.7	1.25x3.39	4	CS	10 <sup>1</sup> / <sub>2</sub>	75	CS	2.62x1.75	4	2.75x2.25	2.75x2.75	abdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	1110	25 <sup>3</sup> / <sub>4</sub>	37 <sup>1</sup> / <sub>2</sub>	53 <sup>1</sup> / <sub>2</sub>	11
HG	CI	4.75	55.7	1.18x3.93	4	CS	10 <sup>1</sup> / <sub>2</sub>	118.7	CS	2.75x2.50	4	2.75x3.00	2.75x3.00	abdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	1280	25 <sup>3</sup> / <sub>4</sub>	37 <sup>1</sup> / <sub>2</sub>	60 <sup>1</sup> / <sub>2</sub>	12
HG	CI	4.68	119.7	1.18x3.93	4	CS	10 <sup>1</sup> / <sub>2</sub>	118.7	CS	2.75x2.50	4	2.75x3.00	2.75x3.00	abdeg	CH	7 <sup>1</sup> / <sub>2</sub> -18	Str	1 <sup>1</sup> / <sub>2</sub>	No	1270	25 <sup>3</sup> / <sub>4</sub>	37 <sup>1</sup> / <sub>2</sub>	60 <sup>1</sup> / <sub>2</sub>	13

DFS—Drop Forged Steel Dur—Duralumin  
 e—Timing Gears  
 Ext—Extruded Steel  
 f—Accessories Drive  
 F—In Head and Side ("F" Head)  
 FA—Fire Apparatus  
 g—Rocker Arm Bearings  
 (h)—Intake 30°, Exhaust 45°  
 (H)—Horizontal Motor  
 HB—Horizontal in Block (Valves)  
 HC—Helical Gear and Chain  
 HG—Helical Gear  
 HH—Horizontal in Head (Valves)  
 Hol—Holley Carburetor

I—In Head (Valves)

In—Integral

Ind—Industrial

(k)—850-1550 RPM

K—Kerosene

K-D—Kerosene or Distillate

L—Valves at Side (L-Head)

(m)—900-2000 RPM

M—Marine (Engine Type)

May—Mayer Carburetor

ML—McCord Lubricator System

MS—Mack Stabl-ite Steel

N—No or None

NS—Nickel Steel

Op—Optional

PU—Power Units

r—Reverse Gear

RC—Rail Cars

S—Steel

SB—Spiral Bevel Gear

SG—Spur and Bevel Gear

Sch—Schebler Carburetor

Se—Separate

SG—Spur Gear

Sho—Shore Carburetor

Sil—Silchrome Steel

Spec—Special

SS—Semi-Steel

Str—Stromberg Carburetor

SZ—Schebler and Zenith Carburetor

t—Tappets

T—Valves opposite ("T" Head)

T—Trucks

Ta—Taxicabs

Til—Tillotson Carburetor

Tim—Timken Bearings

Tun—Tungsten Steel

TZ—Tillotson or Zenith Carburetor

W—Block cast in one piece, removable wet liners used

Y—Yes

Zen—Zenith Carburetor

## Census of Numbered Motorboats\*

January 1, 1939

District	Symbol	No.	Total	District	Symbol	No.	Total
Baltimore, Md.	13	15,023		Norfolk, Va.	14	9,549	
Boston, Mass.	4	10,003		Ogdensburg, N. Y.	7	5,371	
Bridgeport, Conn.	6	6,054		Omaha, Neb.	46	452	
Buffalo, N. Y.	9	4,604		Pembina, N. D.	34	92	
Charleston, S. C.	16	1,203		Philadelphia, Pa.	11	13,841	
Chicago, Ill.	39	4,202		Pittsburgh, Pa.	12	1,679	
Cleveland, Ohio	41	8,222		Port Arthur, Tex.	21	1,743	
Denver, Colo.	47	3		Portland, Me.	1	7,951	
Des Moines, Iowa	44	1,343		Portland, Ore.	29	6,663	
Detroit, Mich.	38	11,354		Providence, R. I.	5	2,780	
Duluth, Minn.	36	1,697		Rochester, N. Y.	8	4,478	
Galveston, Tex.	22	4,174		St. Albans, Vt.	2	1,716	
Great Falls, Mont.	33	13		St. Louis, Mo.	45	5,592	
Honolulu, T. H.	32	1,490		St. Thomas, V. I.	51	41	
Indianapolis, Ind.	40	1,101		San Antonio, Tex.	23	2,006	
Juneau, Alaska	31	3,825		San Diego, Cal.	25	878	
Los Angeles, Cal.	27	4,835		San Francisco, Cal.	28	10,145	
Louisville, Ky.	42	1,930		San Juan, P. R.	49	248	
Memphis, Tenn.	43	2,728		Savannah, Ga.	17	1,427	
Milwaukee, Wis.	37	5,466		Seattle, Wash.	30	13,369	
Minneapolis, Minn.	25	2,182		Tampa, Fla.	18	12,979	
Mobile, Ala.	19	3,049		Wilmington, N. C.	15	4,590	
New Orleans, La.	20	8,871		Total		240,050	
New York, N. Y.	10	29,188					

\*Bureau of Marine Inspection and Navigation, Dept. of Commerce.

# AMERICAN AIRCRAFT ENGINES

Cylinder Data											
Engine Make and Model		Ratings			Performance						
Arrangement		Bore and Stroke (in.)		Number of Cylinders		Horsepower		R.P.M.		Fuel Required	
Arrangement	Number of Cylinders	Bore and Stroke (in.)	Stroke (in.)	Exhaust	Intake	Maximum (Except Take-off)	Take-off	Cruising	Engine Dry Weight	Oil Consumption	Gasoline Consumption
No. of Valves per Cylinder						(Lb.)	(Lb.)	(Lb.)	(Gals. per hour)	(Gals. per hour)	(Gals. per hour)
Department of Commerce Licensee of A.T.C. No. 1000											
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# AUTOMOTIVE DIESEL AND OTHER HEAVY OIL ENGINES

## ABBREVIATIONS

**Als**—Aluminum alloy—steel strut  
**(b)**—Two rows of  $\frac{1}{16}$  diam. holes—64 total in cylinder

I—Industrial	M—Marine	Mu—Multiple	N—Nickel iron	O—Open
PC—Precession chamber	PI—Pearlite malleable iron	Pin—Pin	Pu—Power unit	P—Rail cars
Pr—Power	Si—Single	Ps—Stationary	St—Stationary	T—Tractor
Si—Single	Sta—Stationary	T—Tractor	Tc—Top center	Tc—Turbulence chamber
T—Tractor	Tc—Turbulence chamber	Tc—Top center	Tci—Tim plated cast iron	Tr—Tractors
Ti—Turbulence chamber	Tci—Tim plated cast iron	Tci—Tim plated cast iron	Tv—Verticals	W—Welded

<b>Al</b> -	Aluminum
<b>(b)</b> -	Two rows of liner
<b>B</b> -	Before top center
<b>B</b> -	Buses
<b>BB</b> -	Before bot to bot
<b>(c)</b> -	Up to 20,000
<b>C</b> -	Closed (valve)
<b>C</b> -	Cast iron
<b>CMS</b> -	Chrome m.
<b>CNM</b> -	Chrome n.
<b>DI</b> -	Direct inject
<b>E</b> -	Electric
<b>Eel</b> -	Electric
<b>H</b> -	Hand
<b>H</b> -	Hand or oil

- 1. Exhaust only
- 2. Less generator, starter, fan, water and exhaust manifold
- 3. With all accessories needed for normal operation
- 4. Data for marine engines
- 5. Also built with 2, 3 and 4 cylinders
- 6. Also built with 4 and 6 cylinders
- 7. Also built with 4 cylinders
- 8. For starting only, gasoline and spark ignition
- 9. Two exhaust valves per cylinder
- 10. After top center
- 11. Air (starting method)
- 12. After bottom center
- 13. Air chamber
- 14. Air or electric
- 15. Air or electric
- 16. Air or electric
- 17. Air or electric
- 18. Air or electric
- 19. Air or electric
- 20. Air or electric

### Automotive Industries

# EXPORTS

## Leading Automotive Export Markets—1938

U. S. Factory Shipments only—does not include Canadian Exports

Passenger Cars and Chassis			Trucks, Buses and Chassis		
Country of Destination	Value	Units	Country or Destination	Value	Units
Union or South Africa	\$14,213,361	23,373	Argentina	\$3,855,674	7,792
Argentina	10,108,823	18,727	Canada	3,711,148	2,527
Canada	8,673,633	12,057	Venezuela	3,708,316	4,622
Sweden	8,285,800	13,986	France	3,503,596	3,419
Belgium	6,833,082	11,175	Hong Kong	3,312,967	5,706
Australia	6,706,427	16,423	Union of South Africa	3,028,054	5,769
Brazil	3,891,126	6,523	Belgium	2,660,777	6,120
United Kingdom	3,289,530	4,243	Sweden	2,609,809	5,652
Hawaii	2,868,340	3,964	China	2,591,417	4,455
Venezuela	2,204,298	3,088	Australia	2,545,684	4,962
Philippine Islands	2,088,005	2,815	Brazil	2,541,508	4,580
Mexico	2,080,356	2,845	British India	2,350,725	5,682
Cuba	2,071,449	2,702	Japan	2,091,237	5,802
Egypt	2,063,723	2,793	Spain	1,927,073	2,498
British India	1,809,823	2,861	Colombia	1,912,395	2,451
Colombia	1,681,217	2,142	Philippine Islands	1,782,481	2,274
Norway	1,615,852	2,402	Norway	1,674,486	2,867
New Zealand	1,544,022	2,362	Iran	1,485,485	894
Netherlands	1,266,948	1,631	Kwantung	1,399,490	2,188
Puerto Rico	1,258,275	1,673	Peru	1,391,601	1,895
Total	\$84,554,090	137,785	Total	\$50,083,923	82,155
Total All Countries	\$104,628,982	167,693	Total All Countries	\$74,451,986	117,943

## Value of Leading U. S. Automotive Exports\*

Passenger Cars	\$104,628,982
Passenger Cars, Used	842,083
Trucks, Buses and Chassis	74,451,986
Trucks and Buses, Used	73,993
Trailers	1,021,364
Engines, for Assembly:	
Truck and Bus	122,755,6
Passenger Car	3,160,057
Engines for Replacement	190,139
Parts for Assembly	46,473,076
Parts for Replacement	37,778,147
Truck and Bus Casings	5,513,154
Other Automobile Casings	7,732,680
Inner Tubes	1,688,678
Solid Tires	173,164
Tire Sundries and Repair Materials	770,895
Storage Batteries	1,698,083
Battery Chargers	237,694
Portable Electric Tools	1,382,303
Motorcycles	989,076
Motorcycle Parts and Accessories	308,902
Aeronautical Products	68,700,366
Total	\$360,569,948

### CANADIAN

Cars	\$ 15,311,201
Trucks	6,924,273
Parts and Accessories	2,679,265
Tires and Tubes	7,904,552

Total ..... \$ 32,819,291

Grand Total Exports of American Manufacture ..... \$393,389,239

\* Automotive-Aeronautics Division, Bureau of Foreign and Domestic Commerce.

## American Passenger Car Exports—1938\*

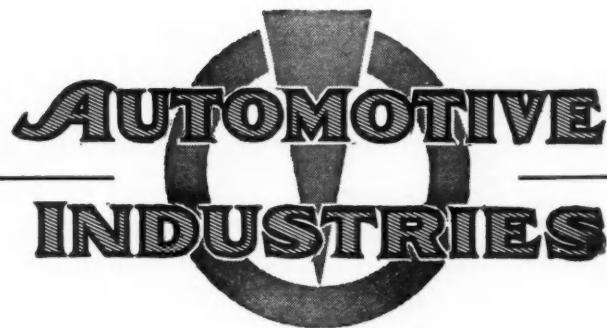
COUNTRIES	Not over \$850		Over \$850, not over \$1200		Over \$1200, not over \$2000		Over \$2000		Total 1938 Passenger Cars		Total 1937 Passenger Cars	
	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars
Europe	39,388	\$22,210,082	5,516	\$5,343,944	757	\$1,170,344	252	\$614,930	45,913	\$29,339,300	58,222	\$35,988,255
North America	16,251	10,329,191	3,328	3,200,963	721	1,042,112	127	352,241	20,427	14,924,507	32,146	22,226,633
South America	30,384	16,670,344	3,291	3,185,965	387	561,101	104	223,708	34,166	20,641,118	42,035	23,972,824
Asia	11,878	6,985,288	1,636	1,584,569	233	344,539	52	145,113	13,799	9,059,509	24,857	14,942,902
Oceania	18,179	7,660,483	575	523,891	45	66,737	6	14,573	18,805	8,265,684	26,656	11,097,695
Africa	25,201	14,470,764	3,031	2,910,752	213	315,608	57	215,969	28,502	17,913,093	45,570	26,586,415
Total	141,281	\$78,326,152	17,377	\$16,750,084	2,356	\$3,500,441	598	\$1,566,534	161,612	\$100,143,211	229,486	\$134,814,725
Alaska									417	340,770	400	319,625
Hawaii	3,478	2,384,954	430	397,448	49	70,043	7	15,895	3,954	2,888,340	4,951	3,440,206
Puerto Rico	1,298	887,093	348	329,636	26	39,404	1	2,142	1,673	1,258,275	2,813	2,017,499
Virgin Islands	23	14,856	4	3,530			27		18,386	69		46,148
Grand Total	146,080	\$81,613,055	18,159	\$17,480,698	2,431	\$3,609,888	606	\$1,584,571	167,693	\$104,628,982	237,719	\$140,638,203

\* Automotive Division, Bureau of Foreign and Domestic Commerce.

## American Truck Exports—1938\*

COUNTRIES	Under 1 Ton		1 Ton and not over 1 1/2 Tons		Over 1 1/2 Tons and not over 2 1/2 Tons		Over 2 1/2 Tons		Bus Chassis		Total 1938 Trucks, Buses and Chassis		Total 1937 Trucks and Buses		
	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars	
Europe	3,975	\$1,415,845	23,214	\$12,086,952	3,618	\$2,865,009	2,631	\$4,312,993	843	\$591,972	34,281	\$21,272,771	45,981	\$30,593,502	
North America	1,457	790,033	4,214	2,688,483	1,171	1,143,504	1,075	2,846,177	67	116,780	7,984	7,584,977	15,865	12,919,353	
South America	3,607	1,531,930	17,103	10,278,971	1,984	1,775,186	856	1,483,395	208	141,320	23,758	15,210,802	32,457	19,040,365	
Asia	2,015	799,986	25,481	12,630,033	2,902	2,106,088	577	1,972,741	78	289,103	31,053	17,797,951	37,457	19,829,522	
Oceania	2,000	810,821	3,025	1,585,569	857	700,177	126	207,292	11	15,508	6,019	3,319,367	9,349	4,718,291	
Africa	4,098	1,796,316	6,871	3,604,988	1,031	826,087	470	675,639	30	28,032	12,500	6,931,062	24,601	13,004,439	
TOTAL	17,152	\$7,144,931	79,908	\$42,874,996	11,563	\$9,416,051	5,735	\$11,498,237	1,237	\$1,182,715	115,595	\$72,116,930	165,710	\$100,105,472	
Alaska										267		271,740	350	315,150	
Hawaii	438	262,870	395	288,943	98	112,703	118	589,529	1	4,050	1,050	1,257,895	1,788	1,607,772	
Puerto Rico	186	103,133	569	403,398	233	227,542	20	55,213		1,008	789,286	1,166	821,368		
Virgin Islands	4	2,414	18	11,725	1	1,996				23	16,135	62	40,177		
GRAND TOTAL	17,780	\$7,513,148	80,890	\$43,579,062	11,895	\$9,758,292	5,873	\$12,142,979	1,238	\$1,186,765	117,943	\$74,451,986	169,076	\$102,889,939	

\*Automotive Division, Bureau of Foreign and Domestic Commerce.



## Production Upturn Expected in March

### Week's Output Estimated at About 78,000 Units

Month-end adjustment of production schedules and work stoppage resulting from the factional dispute within the United Automobile Workers Union combined to bring about a reduction in the output of cars and trucks during the week ending Feb. 25.

Car and truck production for the week is estimated as somewhere between 76,000 and 78,000 units, a drop of several thousand from the preceding week and probably the lowest total for any week in the month. February production to date has totaled approximately 285,000 cars and trucks which places the month well ahead of 1938 when 202,597 cars and trucks were turned out during the entire month. With two days still to go, representing half a week in most plants, the February total this year should be well over 300,000 units although probably lower than 330,000, originally projected.

An upturn in productive rate is confidently expected during March although the usual seasonal step-up in sales will have to be evident before that occurs as all manufacturers are continuing to base their production schedules on orders received from the dealer organization. The industry probably will begin March at a slightly lower level than that in effect at the beginning of February with succeed-

(Turn to page 266, please)

### Goodrich Reports 1938 Profit of \$2,240,119

Consolidated net profit of the B. F. Goodrich Co. for 1938 amounted to \$2,240,119 after all charges and provisions for federal income taxes, according to the preliminary statement.

After provision for the year's dividend requirements on the company's \$5 cumulative preferred stock, these earnings were equivalent to 14 cents a share on the company's 1,314,296 shares of common stock outstanding and compared with a consolidated net loss of \$878,580 in 1937. The company reported a net loss of \$209,551 for the six months ended June 30, 1938.

**AUTOMOTIVE INDUSTRIES**  
**Summary of Automotive Production Activity**  
**(Week Ending Feb. 25)**

**BUSES** Major upward revisions in production schedules do not appear to be the prospect for the immediate future. Vaguely encouraging are persistent rumors that some big orders are soon due to materialize.

**TRUCKS** While one large producer takes the view that "anything is likely to happen to change the picture," consensus seems to be that the outlook for 1939 is reasonably good. There are a few reports of slight increases in production.

**TRACTORS** No change. Typical manufacturer view is "there are so many factors which may influence farm prices that a forecast for 1939 is difficult."

**AUTOMOBILES** Production dropped several thousand from the preceding week to aggregate approximately 78,000 units. March is expected to bring an upturn in output rate.

**MARINE ENGINES** No new activity to brighten the outlook in this field.

**AIRCRAFT ENGINES** Orders show gains in spite of peak production by large and small companies. Several companies report slightly increased demand for experimental engineers to handle larger volume of development work.

*This summary is based on confidential information of current actual production rates from leading producers in each field covered. Staff members in Detroit, Chicago, New York and Philadelphia collect the basic information, in all cases from official factory sources.*

(Copyright 1939, Chilton Co., Inc.)

## Government Seeking \$1,053,474 "Damages" from 18 Tire Makers

### Department of Justice Files Suit Charging Price Fixing Conspiracy in Identical Bids

Instituting an ambitious campaign to break up a practice followed by numerous industries, the Department of Justice for some undisclosed reason singled out the automobile tire industry to file a triple damage suit charging that identical bids submitted to the Government create a presumption of a combination to fix prices. This suit is the first of the kind ever entered by the Federal Government. It is a civil action taken under Sec. 7 of the Sherman anti-trust law.

Filed on Feb. 20 in the United States District Court for the Southern District of New York, the Department said this type of suit was selected because criminal action would not compensate the Government inasmuch as the fine recoverable would be only \$5,000 because injunctive relief is inappropriate since

the tire manufacturers no longer submit identical bids.

The amount of damages the Government is seeking from the 18 tire manufacturers named in its complaint is \$1,053,474. This sum represents three times the difference between the prices paid by the Government during the purchasing period, April 1, 1938, to Sept. 30, 1938, after the so-called "conspiracy" had ceased and the higher prices during the three preceding six-month periods.

The fact that the suit was begun after tire manufacturers have ceased presenting like bids is one of the puzzling reasons why the tire industry was chosen for Government attack. The suggestion has been made that the Government feels it has a good case

(Turn to page 258, please)

# Rumors of Big Orders for Sheets Bolsters Steel Market Sentiment

## Competition Among Producers for Slice of New Automotive Business Will Be Unusually Sharp

Steel producers continue in an expectant mood regarding flat rolled steel tonnage orders from automobile manufacturers. Market gossip persists that several good-sized commitments for automobile sheets are in the offing. Competition for a slice of this business is certain to be keen. The sharp contrast between the high rate at which Detroit district mills have been operating lately and the moderate pace in other steel-producing areas bids fair to make the battle for orders from automobile manufacturers more spirited than usual.

Since the change in the basing point system, Detroit quotations have been on a delivered basis, \$2 a net ton higher than the f.o.b. quotations of Cleveland, Youngstown, Pittsburgh, and Chicago mills. This differential set-up has not affected the ability of Detroit producers to more than hold their own in their home market. Some fill-in business came out early this week at unchanged prices. While there is talk of producers planning to adjust prices of some products which, they contend, are underpriced, it is highly improbable that changes in the base prices of rolled flat steel products are contemplated.

Purchasing agents of automobile manufacturers apparently consider it good policy for the present to place orders more frequently rather than to anticipate requirements too far in advance. When it comes to cold rolled automobile sheets, however, they are compelled to make allowance for the time it takes for finishing operations, and sheets needed late in March and early in April have to be ordered now. Routine conditions prevail in the market for cold-finished carbon and alloy steel bars. Demand for bolts and nuts is fair. There is also some inquiry for manufacturing wire. Washington's Birthday is not considered a production holiday in the steel industry, but the mild recession in this week's employed ingot capacity, which the American Iron & Steel Institute reported at 53.7

(Turn to page 273, please)

## Yellow Truck Will Pay \$1.75 Dividend April 3

Yellow Truck & Coach Co. has declared a quarterly dividend of \$1.75 per share on the 7 per cent cumulative preferred stock, payable April 3, 1939, to stockholders of record March 13, 1939.

Net sales of company for the year ended Dec. 31, 1938, were \$44,180,853. The preliminary consolidated net profit, subject to final audit, for the year ended Dec. 31, 1938, amounted to \$514,983, after deducting provision for de-

preciation of \$1,060,931 for plants and equipment and provision for Federal taxes on income of \$15,224. The above compares with net sales of \$73,451,555, and a net profit of \$3,571,669 for the year ended Dec. 31, 1937.

## Houdaille Will Pay 62½ Cents Per Share

At a meeting held Feb. 16, 1939, the directors of Houdaille-Hershey Corp. declared the regular quarterly dividend of 62½ cents per share on its Class A No Par Value stock, payable April 1, 1939, to stockholders of record at the close of business on March 20, 1939.

## Studebaker Sales Rose 57 Per Cent in January

The Studebaker Corp. reports January factory sales of passenger cars and trucks of 4736 against 3010 in 1938, an increase of 57 per cent. January sales compared with 4992 units sold in December, the seasonal contraction amounting this year to 5.1 per cent. A year earlier the decline in January from December sales amounted to 36 per cent, 3010 units being sold in Janu-

ary against 4720 in December. Retail deliveries of passenger cars and trucks in the United States last month amounted to 3171 against 3035 a year ago.

## Early February Gains Reported by Buick

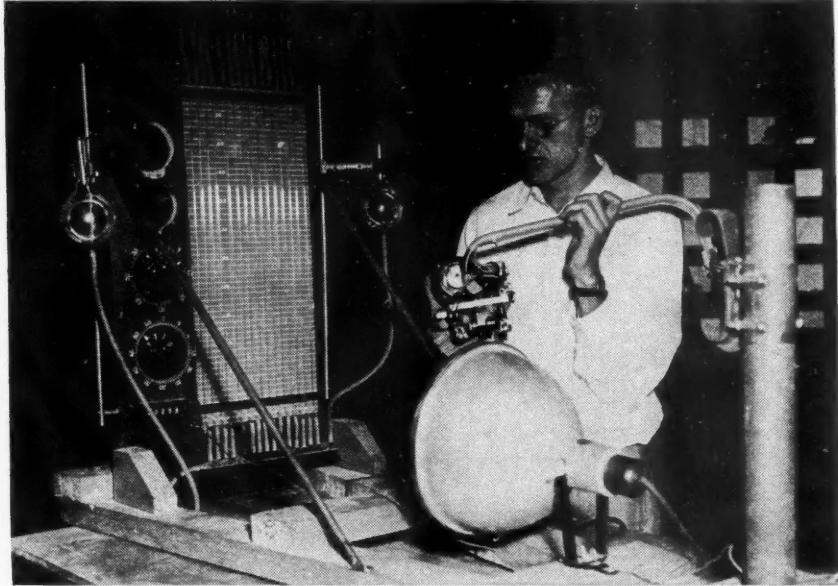
Domestic retail deliveries of Buick cars during the first 10 days of February totaled 3917 units, compared with 3626 in the first 10 days of January, a gain of 291 units or 8 per cent, and with 2860 in the corresponding February period last year, a gain of 1057 units or 37 per cent.

Used car stocks were reduced during the period with used car sales totalling 8688 against 7933 in the first January period and 8133 in the corresponding 10 days in February last year.

## 40 Years Ago

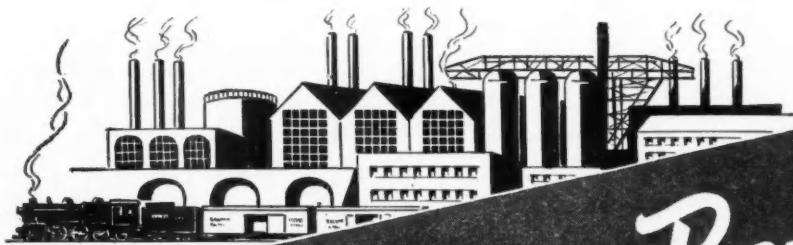
In Belgium a company has been formed for the purpose of establishing on all the principal high roads of Europe electric power stations, or electric posting stations for motor tourists. At each station there is to be a bar and restaurant, and a repair shop, which will be in charge of expert mechanics. Storage batteries can be recharged "while you wait," and medical attendance will be on hand in case of accidents.

From *The Horseless Age*,  
February, 1899.



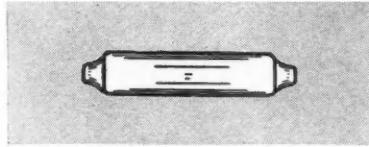
Air Velocity Device

Robert Schairier, graduate student at the California Institute of Technology, Pasadena, Calif., is shown with a recording motor and arm which indicates the velocity of air as it travels over the surface of an airplane wing. The speed of the air is recorded on the instrument shown at the left.

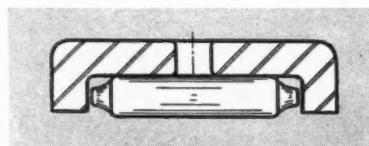


# How Industry Benefits FROM THIS NEW-TYPE QUILL BEARING

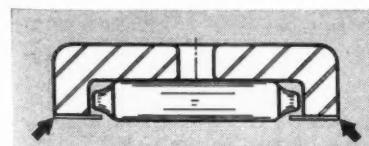
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RANGE OF  
SIZES  
CARRIED  
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Correctly proportioned rollers with husky curvilinear trunnions eliminating high stresses on trunnions. Accurately hardened and ground for long life.



One-piece channel-shaped outer race. Rigid surfaces all accurately hardened and ground providing solid abutment for end of roller. Assures longer bearing life.



All fragile parts have been eliminated. Simplified method for definite roller restraint. Function of the retaining band is completed when bearing is assembled.

**E**ACH separate type of Bantam Bearing has been designed and built to meet a recognized industrial need. The new **STANDARD SERIES QUILL BEARINGS** are Bantam's answer to industry's demand for quill bearings that require less space . . . permit high load capacity . . . are easier to assemble and insure greater reliability at definitely lower cost.

Users of large capacity radial bearings have been quick to recognize the fulfillment of these requirements. Test installations have brought quick repeat orders and many industries report notable savings in cost and improvements in performance.

Built to the same high quality as Bantam Quill Bearings used on the nation's famous diesel-powered streamlined trains, the low cost of this new-type bearing is due solely to simplified design and standardized quantity production. Carried in stock in sizes  $\frac{3}{4}$ " to 5".

Write for Bulletin 103C which gives complete engineering data. For Needle Bearings to be used in lighter service write our affiliate, The Torrington Company, Torrington, Conn., and ask for Circular 19A.

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Subsidiary of THE TORRINGTON CO.  
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BEARINGS

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## Expect General Increase In Tire Prices by March 1

The tire price increase initiated Feb. 15 by Firestone Tire & Rubber Co., probably will become industry-wide before March 1. With crude rubber prices advancing steadily under refusal of the International Crude Rubber Regulations Committee to increase the crude rubber export quota for the second quarter of 1939, and with observers seeing a strong possibility of 18 or 20-cent rubber by mid-summer, practically all tire manufacturers will follow the Firestone lead on retail price lists. Caught off-guard by Firestone's quick action following the crude rubber committee's action in Amsterdam Feb. 14, other manufacturers hurriedly began revamping their lists. General Tire & Rubber Co. and United States Rubber Co. announced their new prices Feb. 20.

The increases average 1 to 6 per cent on most passenger car tire sizes and 1 to 7 per cent on all truck tire sizes. No change has been made as yet in original equipment prices.

Speculative buying already has entered the crude rubber market and this, observers say, will accelerate the upward price trend. World stocks are low and will shrink considerably under a continuance of the 50 per cent quota.

Not since 1937 have tire prices moved upward. Due to rapidly rising crude prices, there were two 6 per cent tire price increases in the first quarter of 1937, and a 2 per cent upward adjustment in November.

## Passenger Car and Truck Production

(U. S. and Canada)

	January, 1939	December, 1938	January 1938
<b>Passenger Cars—U. S. and Canada</b>			
Domestic Market—U. S.	263,232	305,900	130,273
Foreign Market—U. S.	16,808	20,106	25,232
Canada	11,404	15,518	13,385
<b>Total</b>	<b>291,444</b>	<b>341,524</b>	<b>168,890</b>
<b>Trucks—U. S. and Canada</b>			
Domestic Market—U. S.	48,155	48,252	35,491
Foreign Market—U. S.	10,957	14,088	18,532
Canada	3,390	3,152	4,239
<b>Total</b>	<b>62,502</b>	<b>65,492</b>	<b>58,262</b>
Total—Domestic Market—U. S.	311,387	354,152	165,764
Total—Foreign Market—U. S.	27,765	34,194	43,764
Total—Canada	14,794	18,670	17,624
<b>Total—Cars and Trucks—U. S. and Canada</b>	<b>353,946</b>	<b>407,016</b>	<b>227,152</b>

## Automotive Progress on Parade At the Golden Gate Exposition

*Advances Made by Industry in Past Ten  
Years Are Shown by Elaborate Exhibits*

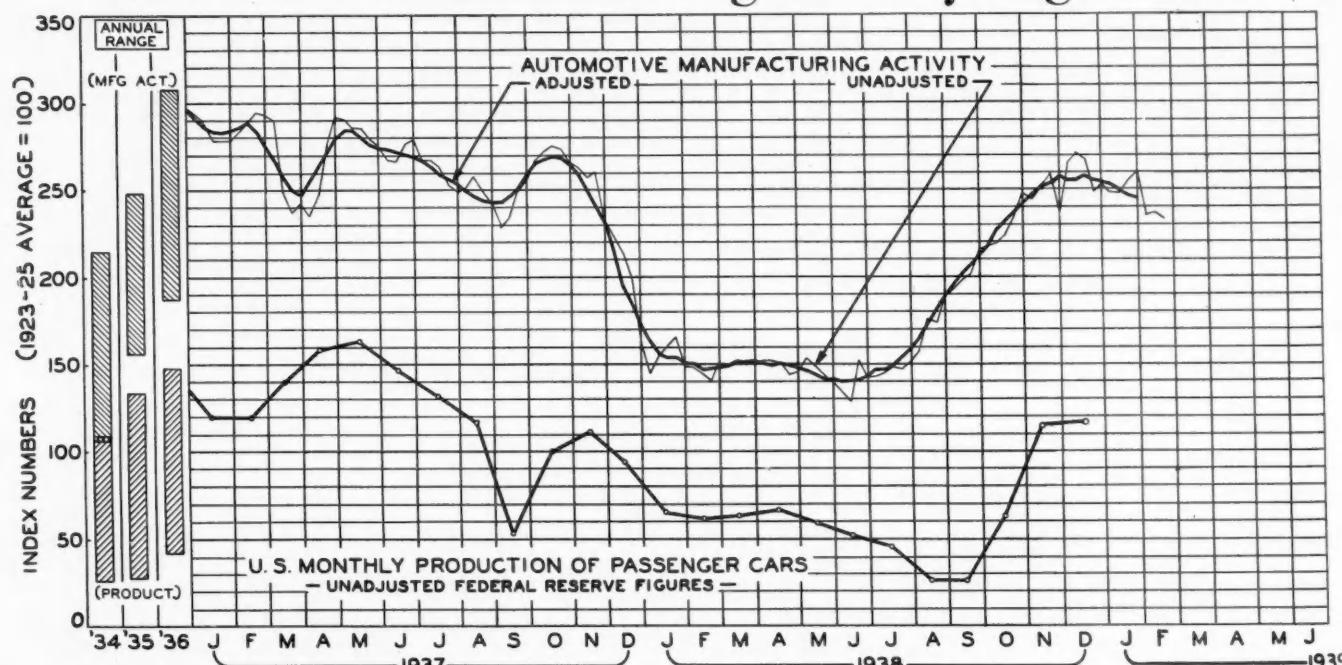
Progress of the past decade is the theme of exhibits by automotive groups who are displaying at Golden Gate International Exposition. Ford Motor Co. built their own building on the Court of Pacifica. Chrysler Corp., General Motors along with the petroleum groups are in the unique Vacaceland Building.

The Ford exhibit, largest in point

of size, gives a dramatic presentation of the scope of the Ford industry. A "Fountain of Western Products" is the title of the exhibit in a horse-shoe shaped entrance hall opening off the court. The fountain displays the raw materials contributed by the Western States. These include sillimanite, copper, silver, lead, wood, petroleum, cattle,

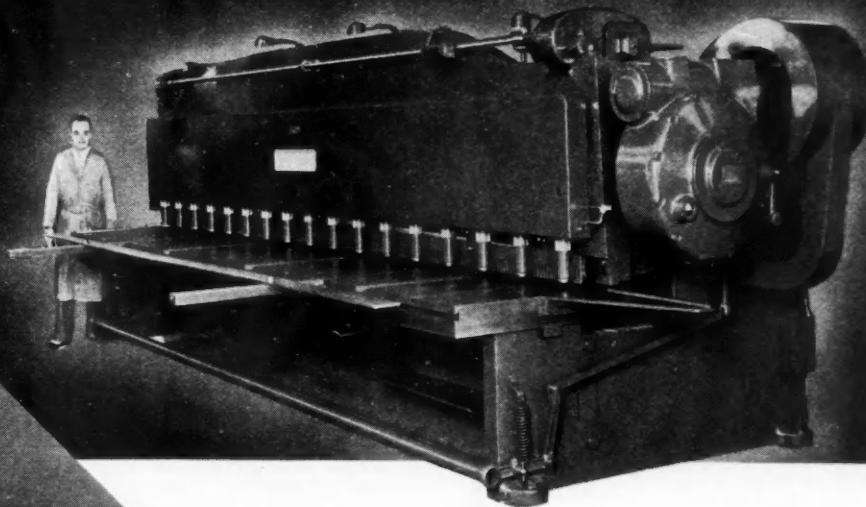
(Turn to page 270, please)

## Automotive Manufacturing Activity Sags to 233

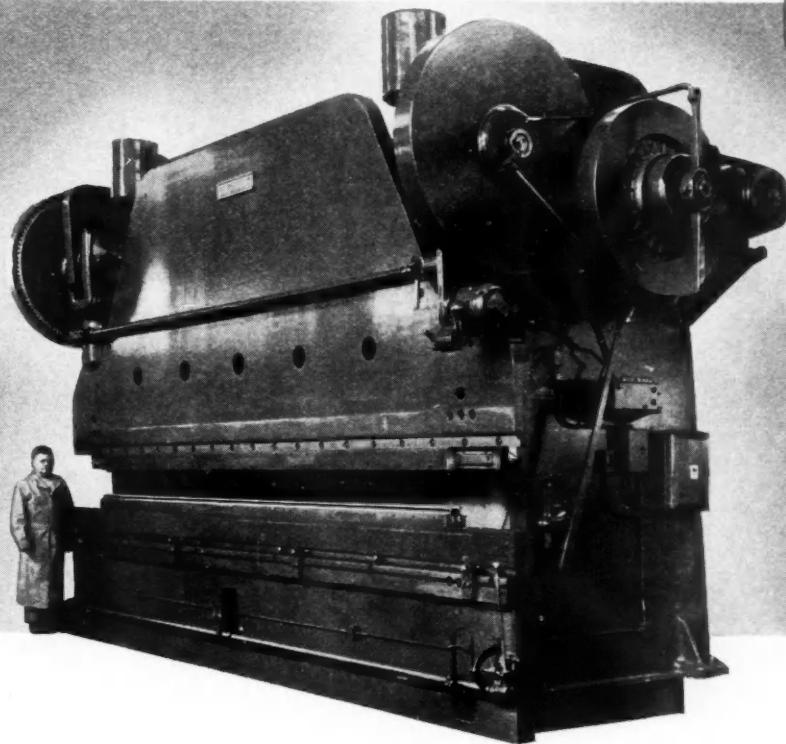


Manufacturing activity sagged again during the week ended Feb. 18, as indicated above by the light line tracing the path of the unadjusted index. The new mark of 233 falls four points below that registered the preceding week. Downward trend of the adjusted index

persists and the heavy black line now touches 245, two points below the last recording. However, as pointed out in the production review on page 251 of this issue, an upturn in productive rate is confidently expected during March.



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Shear • • • • or formed on a Cincinnati  
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THE CINCINNATI SHAPER COMPANY, CINCINNATI, OHIO

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# Industrial Activity Continues At Steady Pace; Fisher's Index, 79.7

*An Exclusive and Regular Weekly Feature  
Written by the Guarantee Trust Co., N. Y.*

Apparent general steadiness was the dominant feature of industrial activity last week. For the preceding week, ended Feb. 11, the *Journal of Commerce* index advanced to 85.4 from 84.9, as compared with 68.9 a year ago.

A pronounced increase in retail sales last week was reported by Dun &

Bradstreet, registering an estimated margin of 3 to 6 per cent above the comparable 1938 level. Department store sales in the week ended Feb. 11, according to data compiled by the Board of Governors of the Federal Reserve System, were only 2 per cent below the corresponding 1938 turn-

over, as against a comparable 6 per cent margin for the preceding week.

A further decline in the output of electricity by the light and power industry in the week ended Feb. 11 continued the usual seasonal trend; but the margin of this year's output above last year's comparable levels was raised to 10.5 per cent as against 9.8 per cent in the preceding week.

Railway freight loadings in the same week numbered 579,918 cars, as compared with 576,790 cars in the week before, and exceeded the loadings a year ago by 6.8 per cent.

Average production of crude oil in the week ended Feb. 11, was estimated at 3,283,700 barrels. The drop of 158,250 barrels from the average in the preceding week was a reflection of the resumption of a five-day production week in Texas. Current daily requirements, as computed by the U. S. Department of the Interior, are 3,220,000 barrels.

The average daily production of bituminous coal in the same period advanced to 1,424,000 tons, as compared with 1,346,000 tons in the preceding week and 1,125,000 tons a year ago.

Engineering construction awards in the week ended Feb. 16, totaled \$42,410,000, as against \$41,534,000 in the preceding week, according to *Engineering News-Record*. For the year to date awards are 30 per cent above the initial seven-week total last year.

Reported lumber production, shipments, and new orders declined in the week ended Feb. 11. As now estimated by the Department of Commerce, the national consumption of lumber in the first quarter of the year will exceed by 20 per cent the comparable use in 1938.

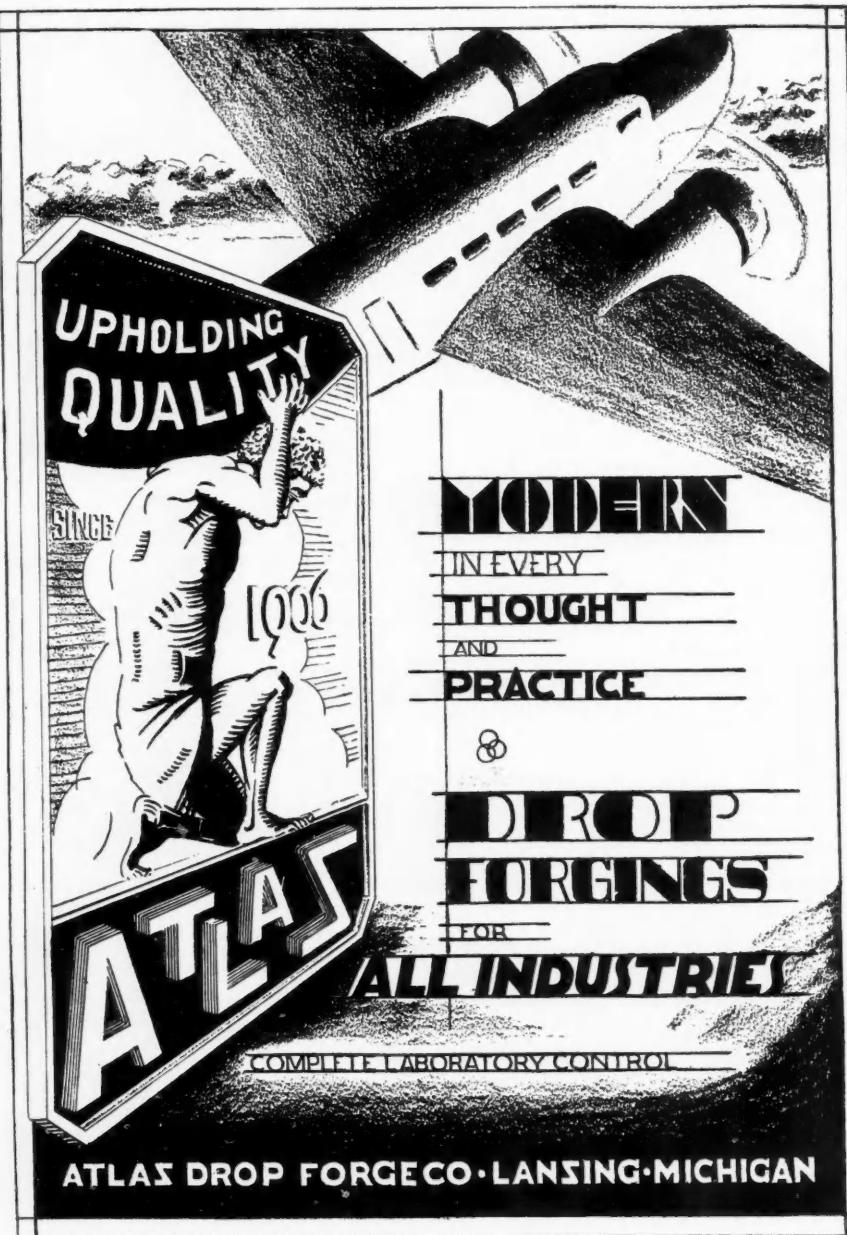
The seasonal slackening of cotton-mill activity in the week ended Feb. 11, was reflected in the unchanged index of the *New York Times*. The present level of 117.8 compares with 88.7 a year ago.

Professor Fisher's index of wholesale prices for the week ended Feb. 18 stands at 79.7, as against 79.5 for the week before and 79.8 for each of the three weeks preceding.

Reserves of member banks of the Federal Reserve System, continuing the decline recorded in recent weeks, dropped \$310,653,000 in the week ended Feb. 15. The decline of \$290,000,000 in estimated excess reserves brought the total to \$3,170,000,000. A reduction of \$2,335,000 in bills discounted by the Federal Reserve banks canceled nearly all the gain recorded in the preceding week.

## GM-Cornell Index Moves Down to 60.7

The General Motors-Cornell World Price Index of 40 basic commodities for the week ended Feb. 11 was 60.7, compared with 60.9 for the previous week. The United States index in gold increased 0.6 point to 62.9.



## Pontiac Sales Up 64.3% in January

Retail deliveries of new Pontiac cars throughout the United States for the month of January were 10,360, an increase of 64.3 per cent over the 6304 sales of January, 1938, and a decrease of 27.7 per cent from the December figures of 14,335.

New car inventories in dealers' hands Jan. 31, were at 23,009 which is 25.9 per cent less than they were one year ago.

Sales of used cars increased steadily throughout January finishing strongly with a total of 23,797 which is an increase of 13 per cent over December and within 4.4 per cent of January, 1938, at which time intensive campaigns were under way everywhere in an effort to break the used car jam.

Used car inventories on Jan. 31 were 29,644, an increase of only 71 cars over the twentieth of the month and 25 per cent less than the high 39,357 figure of Jan. 31, 1938.

## Thomas Truck Buys Wm. H. Sippel Corp.

Announcement has been made by J. F. Thomas, president and general manager of the Thomas Truck & Caster Co., Keokuk, Iowa, that his firm has purchased the business of the Wm. H. Sippel Corp., South Bend, Ind., manufacturers since 1925 of truck casters, floor trucks, industrial trailers, and skid platforms. The Sippel products will be combined with the Thomas line of casters and trucks, and all production carried on in the Keokuk plant.

## Atlas Acquires Control Of Thornburg Diesel

Atlas Imperial Diesel Engine Co. has announced the consummation of negotiations through which it has acquired controlling interest in the further development and manufacture of "America's smallest Diesel engines."

A new company, Atlas-Thornburg Diesel Engines, Inc., has been organized to take over the assets of Thornburg-Diesel Engines, Inc., which developed and formerly manufactured the engines in a small way in North Kansas City, Mo. Atlas Imperial has acquired 51 per cent of the stock of the new corporation, the remaining 49 per cent having been distributed to stockholders of Thornburg Diesel. It is pointed out by P. H. Kilberry, president of Atlas, that this minority stock is subject to repurchase by Atlas-Thornburg at any time within three years.

The machinery, fixtures, jigs, inventory and other physical assets acquired from Thornburg are being moved to the Atlas plant at Mattoon, Ill., where the small engines will be built. Distribution of the engines will be through subsidiaries and factory-

controlled branches of Atlas Imperial, supplemented by a dealer organization to be developed in the United States and foreign countries.

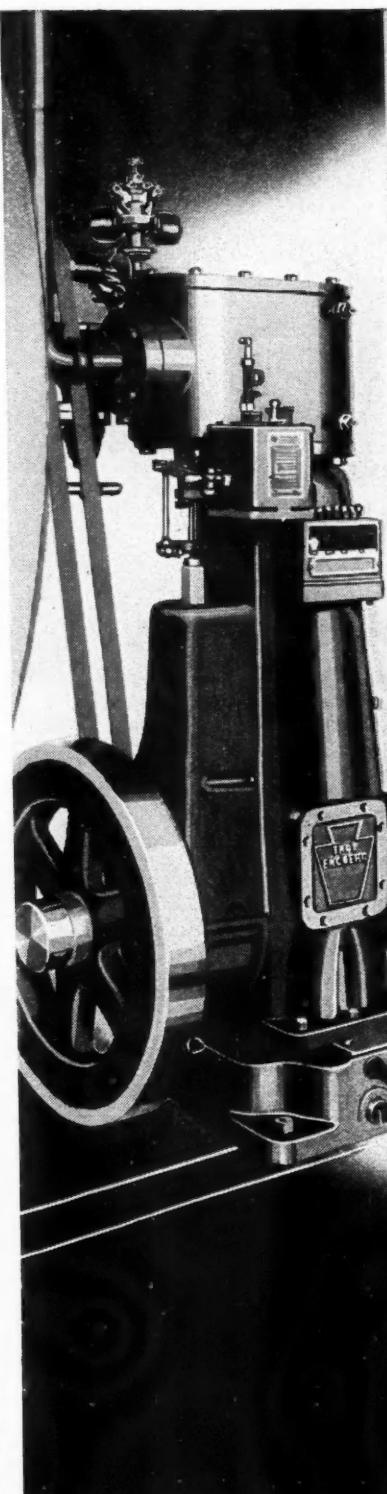
## Harry A. House

Harry A. House, mechanical engineer and inventor of the first automobile in England, died recently at his home in Buffalo, N. Y. He was 73 years old. He had been vice-consul for the United States at Southampton for seven years.

Born in Bridgeport, Conn., he ac-

companied his father, Harry A. House, Sr., also an inventor, to England in 1889. Both first worked on a flying machine and became friends of the Wright brothers who called on them to inspect their work.

The father returned to Connecticut but the son remained in England and designed and built a horseless carriage, which was steam driven with a kerosene-burning engine and smokestack. It attained a speed of 30 miles an hour. Mr. House obtained patents and the first automobile license in England.



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cylinders  
without  
oil?*

Unusual as that may sound, oilless lubrication of cylinders is accepted practice with Troy-Engberg steam engines. Where exhaust steam free from any oil contamination is desired, TROY ENGINE & MACHINE CO. uses "dag" colloidal graphite in water instead of oil . . . . fed into cylinders through special lubricators.

The colloidal graphite forms a heat-resistant lubricating film of graphite on the pistons, rods, and other engine parts requiring lubrication. Graphite films developed on heating pipes also improve heat conductivity.

Where oil in exhaust steam is not a problem, the addition of "dag" to lubricating oil may be effectively used to reduce oil feeds and costs.

Bulletin 150, containing complete data on lubrication of steam engine cylinders with "dag", is yours for the asking.

**ACHESON COLLOIDS  
CORPORATION**

PORT HURON • • • MICHIGAN



# GM Dealer Case Hearings Again Postponed, Now Set for March 1

*Ourselves and Government—A Check List  
Of Federal Action Corrected to Feb. 16*

## FEDERAL TRADE COMMISSION

VS. GENERAL MOTORS. Hearings which were resumed Feb. 15 at Albany, N. Y., and which were scheduled to be moved to Boston on Feb. 23 have been postponed to March 1. The case, identified as the exclusive dealing case, in-

volves the complaint that GM dealers allegedly are required to handle GM parts exclusively.

FOB PRICE CASE. Date for GM hearings in Detroit has been postponed from Feb. 21 to March 7. Hearings also due in the Ford case but date has not been set. It had previously been

scheduled for Jan. 25 but cancelled. The FTC is expected to close the Ford case immediately after the hearings. Both Ford and GM cases involve the FTC allegation that price advertising was misleading.

VS. UNITED STATES RUBBER CO. Respondents have asked for additional time to reply to the complaint and the FCC has further extended the time for filing from March 1 to March 4. The FTC alleged unlawful price discrimination in the sale of tires in violation of the Robinson-Patman Act. Also involved is the United States Tire Dealers Corp. of New York, a subsidiary.

## CIVIL AERONAUTICS AUTHORITY

PURDUE UNIVERSITY, the first of 13 schools selected by the CAA to participate in the \$100,000 NYA flight training program, has enrolled 50 students and classes are under way. Contracts have been let for instruction at five other universities and bids on the remaining seven will be opened Feb. 20. This is the test phase of a program which, if Congress approves, will result in the annual training of approximately 20,000 student pilots.

## TEMPORARY NATIONAL ECONOMIC COMMITTEE

FTC phase of the monopoly investigation will open with public hearings beginning Feb. 28 and lasting about two weeks. The steel, farm machinery, rubber and sulfur industries, together with six others, all in the food field, will be considered by the FTC.

## Government Suit

(Continued from page 251)

against the tire industry and that, thinking it will be successful in court, it will serve as a warning to other industries to stop the practice of submitting identical bids. Among such industries are steel, machinery, cement, lumber, electrical appliances, and many others. For the most part identical bidding is inherent in the nature of the pricing system of these industries. Quoting on a delivered price basis, the greater number of them, steel being a conspicuous example, use a multiple basing point system, and arrive at bids simply by quoting the price at the basing point nearest the source of delivery plus the freight.

"Bids identical to the last penny are not normally the result of identical cost of manufacture, identical marketing cost, and identical profit percentages independently arrived at," the Department statement said in summarizing its position.

It said that in the tire case the evidence of conspiracy consists of the submission by the 18 companies of four sets of bids on automobile tires that were identical to the penny in each in-

**GASKETS FOR THE MOTORS OF TODAY**

The achievements of motor designers have put within the reach of all motorists smooth-running and efficient automobiles. One of the cogs in the wheel of progress has been gasket design, material and workmanship.

Victor has made available better materials, better design and better workmanship in gaskets. Among fairly recent developments are: Asbestos that shows double life in breakdown test; steel-asbestos gaskets with a seal coat applied (Precote); precision die equipment; steel-insert asbestos of especially uniform thickness and structure—Asbestoprene is a treated and coated asbestos for applications such as valve cover. Ask for the Victor booklet, "Gasket Design and Specifications."

**VICTOR**  
**MANUFACTURING & GASKET CO.**  
P. O. BOX 1333—5750 ROOSEVELT ROAD  
CHICAGO, U. S. A.

**VICTOR GASKETS**

THE WORLD'S LARGEST GASKET MANUFACTURER

stance on 82 or more different sizes of tires.

The defendants are:

The Cooper Corp., The Dayton Rubber Mfg. Co., Dunlop Tire & Rubber Corp., The Falls Rubber Co., The Firestone Tire & Rubber Co., The Fisk Rubber Corp., The General Tire & Rubber Co., The B. F. Goodrich Co., The Goodyear Tire & Rubber Co., Inc., The Kelly-Springfield Tire Co., Lee Tire & Rubber Co. of N. Y., Inc., The Mohawk Rubber Co. of N. Y., Inc., The Norwalk Tire & Rubber Co., Pennsylvania Rubber Co., F. G. Schenut Rubber Co., The Seiberling Rubber Co., United States Rubber Products, Inc., and U. S. Tire Dealers Corp.

## Monthly Motor Vehicle Production (U. S. and Canada)

	PASSENGER CARS		TRUCKS		TOTAL MOTOR VEHICLES	
	1939	1938	1939	1938	1939	1938
January	291,444	168,890	62,502	58,262	353,946	227,152
February		151,133		51,464		202,597
March		186,341		52,256		238,597
April		190,111		48,018		238,129
May		168,599		41,575		210,174
June		147,545		41,857		189,402
July		112,114		38,336		150,450
August		61,687		35,259		96,946
September		69,449		20,174		89,823
October		192,906		22,380		215,286
November		335,767		54,638		390,405
December		341,524		65,492		407,016
Total		2,126,066		529,711		2,655,777

## Abstracts

### Sleeve Valves For Aircraft Engines

For aircraft engines the Burt-type single-sleeve valve has the advantages that it does away with the hot exhaust valve, thereby permitting of an increase in the compression ratio, and that it does away with a large number of "bits and pieces." Apparently the sleeve is not subject to either hot or cold corrosion, nor is it liable to suffer damage in case of operation on a weak (oxidizing) mixture. Such mixtures are used when maximum fuel economy is desired, and this point is therefore of great importance. Although it reduces the number of working parts to a minimum and eliminates the undesirable valve spring, it is more costly to produce than the poppet valve. But time and expense are saved in service, due to the fact that the sleeve valve needs no attention during the normal period between engine overhauls.

The Bristol Aeroplane and Engine Co. state that their sleeve-valve engines will run with a compression between one-half and one ratio higher than that of their poppet-valve models, on a fuel of given octane number, due to the elimination of the hot valve. However, these valves have a cooling medium in the stems only; the large American hollow-head valves do not run much above 1200 deg. Fahr. at full load, and they run at a much lower temperature at cruising power.

The Bristol sleeve-valve engine uses a forged aluminum cylinder barrel, with a sleeve of high-expansion steel, nitrided, and working directly in it. Liquid-cooled aircraft engines could have a similar arrangement, but because of the limitations of space in the case of in-line engines, would probably use a steel cylinder barrel. This would eliminate the need for a high-expansion steel, and a more normal steel could be used which could be hardened. —F. R. Banks in *I. A. E. Journal* for December.

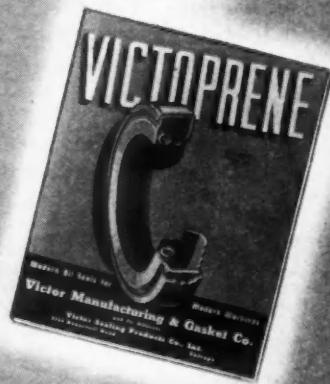


### WHEREVER SHAFTS ARE PROPELLED BY POWER . . .

The special properties of synthetic rubber, particularly resistance to the effect of heat, of aging, of deterioration under oil, are now well known to engineers. The application of synthetic rubber to oil seals is a "natural."

Victor has led the field in applying synthetic rubber to oil sealing problems and the Victoprene oil seal has gone forward with leaps and bounds. Victoprene seals are now used with satisfaction in many applications where heretofore a satisfactory seal was difficult if not impossible to obtain. Ask for the catalog on Victoprene oil seals. The Victor Company solicits the opportunity to submit suggestions on oil sealing problems.

**VICTOR  
MANUFACTURING & GASKET CO.  
P. O. BOX 1333—5750 ROOSEVELT ROAD  
CHICAGO, U. S. A.**



## VICTOPRENE OIL SEALS

THE WORLD'S LARGEST GASKET MANUFACTURER

## English Concern Adopts Direct Injection Design

In AUTOMOTIVE INDUSTRIES of Oct. 8 last an illustrated description was given of a new Diesel engine of the direct injection type that had been introduced by the Associated Equipment Co., London, and offered as an optional type to buyers of A.E.C. buses and trucks. The alternative was the turbulence chamber type that alone had been made by this company for over 10 years, under Ricardo patents for a considerable proportion of that period.

It has now been decided to adopt the

direct injection design in three sizes as standard; the other will be supplied only to special order.

The new unit, it is stated, was introduced originally in response to an insistent demand from operators for a reduced rate of fuel consumption; it effected a 10 per cent economy in comparison with the turbulence chamber variety, with nothing of importance but the cylinder head and piston design being varied.

The Associated Equipment Co. is one of the biggest truck and bus manufacturing concerns in England. Originally it was organized to build London's buses as a subsidiary of the London

General Omnibus Co.; trucks were subsequently added to its products. When the London Transport Board took over the whole of the Metropolitan passenger transport—buses, underground railroads and trams—A.E.C. became dissociated with the bus operating interests, but has continued to supply a large number of gas, oil and trolley buses for London, as well as elsewhere, and a range of heavy duty trucks.

## GM Must Stand Trial In Anti-Trust Case

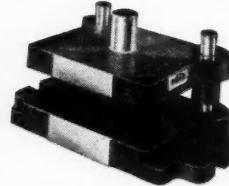
General Motors Corporation and its affiliated finance companies together with officials of those firms must stand trial in United States district court, South Bend, for alleged violation of the federal anti-trust laws. Federal Judge Thomas W. Slick has overruled a demurrer filed by General Motors and fellow defendants against an indictment returned last May by the federal grand jury in South Bend.

Two avenues remain open for General Motors and others named in the indictment. They may fight the case in court as they have indicated they would do or seek to reach a consent decree agreement with the federal government in which they would agree to cease practices of which they are accused.

The Ford Motor Company and the Chrysler Corporation along with their affiliated finance companies were also indicted last spring for similar alleged violations of the anti-trust laws. Both these firms and their co-defendants signed consent decrees with the federal government. These consent decrees, however, become null and void in the event General Motors successfully defends itself and is acquitted in court.



*Die Makers know that Danly Die Sets are accurate in every dimension—there are no added, unpaid costs for further machining, or truing up—no lost time in trying and fitting in mounting the die.*



*Die Users know that dies mounted in Danly Die Sets give them lower cost stamping in freedom from shearing—accurate and faster production—longer runs between re-grinds—and more stampings per die.*

**DIE BUYERS—Specify Danly Die Sets for Your Dies**

**DIE MAKERS—Include Danly Die Sets in Your Estimates**

*It will be good business for you both*

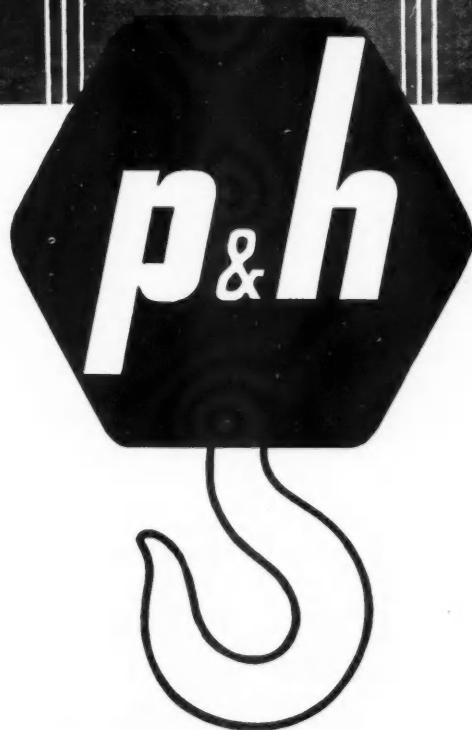
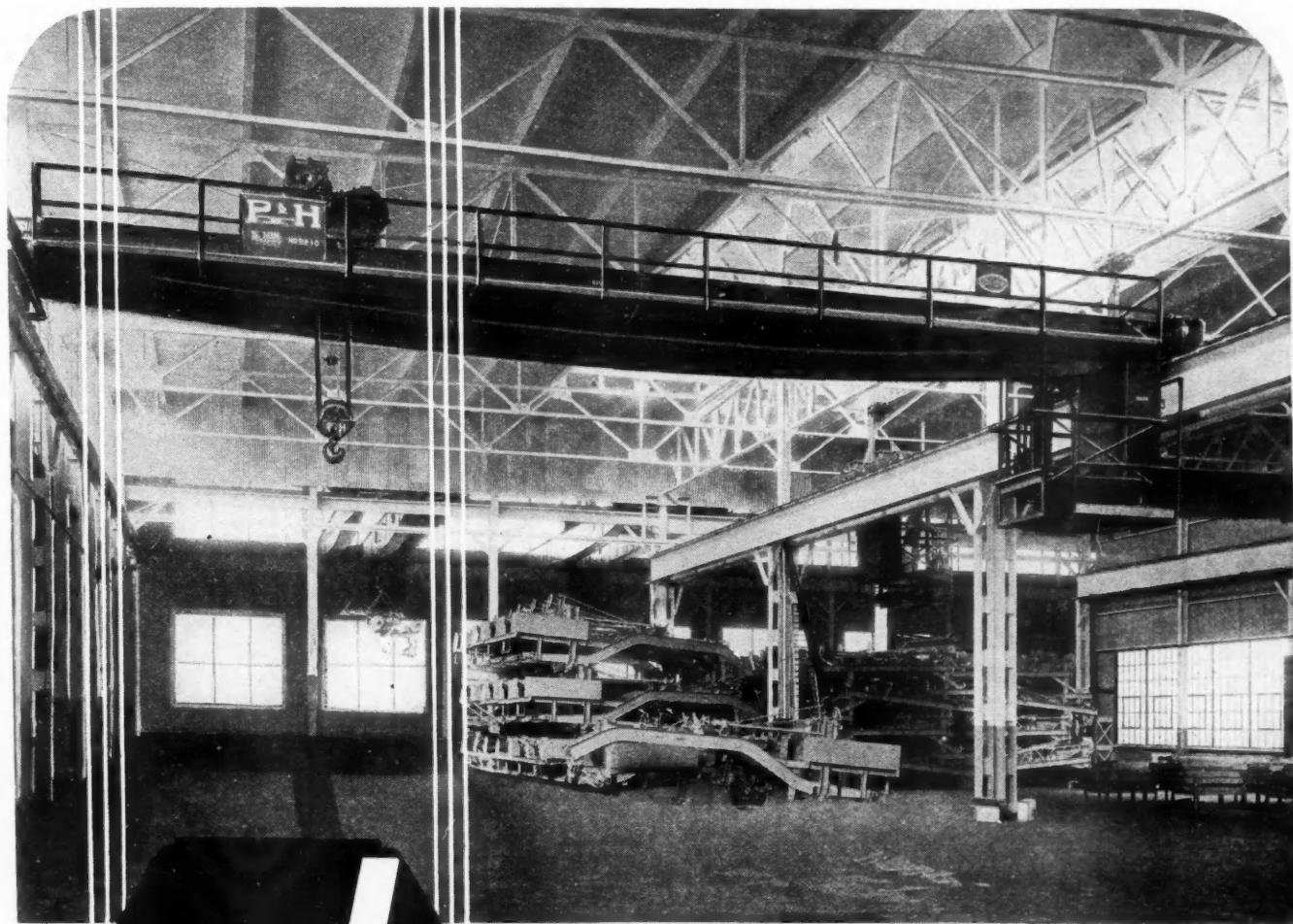
**DANLY MACHINE SPECIALTIES, Inc., 2112 So. 52nd Ave., Chicago, Ill.**

**DANLY DIE SETS AND DIE MAKERS' SUPPLIES FROM THE 8 DANLY BRANCH OFFICE STOCKS**

LONG ISLAND CITY, N. Y. DETROIT, MICHIGAN CLEVELAND, OHIO DAYTON, OHIO  
36-12 34th STREET 1549 TEMPLE AVENUE 1745 ROCKWELL AVENUE 990 E. MONUMENT AVENUE  
PHILADELPHIA, PA. ROCHESTER, N. Y. MILWAUKEE, WIS.  
3913 N. BROAD STREET 16 COMMERCIAL STREET 513 EAST BUFFALO STREET

**DANLY DIE SETS and DIE MAKERS' SUPPLIES**

**Their Dependable Quality Means Lower Cost Stampings**



## ELECTRIC CRANES

You may be sure that your material-handling equipment, built by this group of specialists, will solve your problems in the most efficient manner. The experience of over 50 years . . . of building more than 10,000 cranes . . . is at your disposal through America's largest builder of overhead handling equipment. Harnischfeger Corporation,

**ALL CAPACITIES FROM 5 TO 300 TONS** 4559 West National Avenue, Milwaukee, Wis.

**HARNISCHFEGER**  
CORPORATION

ELECTRIC CRANES • EXCAVATORS • ARC WELDERS



HOISTS • WELDING ELECTRODES • MOTORS

# Work at Plymouth Interrupted By Anti-Martin Faction Strike

**Temporary Stoppage Resulted When Company  
Refused to Discriminate Between Two Groups**

First actual work stoppage to result from the inter-UAW factional fight took place at the Plymouth division of the Chrysler Corp. on Feb. 22, when the plant closed down at noon after members of the Plymouth local supporting the anti-Martin faction called a strike. To prevent trouble the man-

agement closed the plant which was followed by closing of the Briggs body plant supplying Plymouth bodies.

Approximately 28,000 workers were affected including 10,000 at Plymouth, 15,000 at Briggs and 3000 at Dodge working on Plymouth materials. The plant reopened on Feb. 23 with the

announcement that it would be open for all men wishing to work. According to Plymouth officials enough men reported to permit operating one assembly line instead of the two normally operating.

The Plymouth local has been one of the storm centers of the UAW factional fight. Original officers, opposed to Martin, have been suspended by him and the local itself has divided into two factions. When the anti-Martin faction demanded sole bargaining rights, and the management refused to meet with it alone, members of the faction were ordered by their leaders to leave their machines. According to H. L. Weckler, vice-president of Chrysler in charge of operations, the management agreed to meet with the anti-Martin faction if representatives of the other faction also could be present. The management refused to discriminate between factions and the work stoppage resulted.

"The cessation of operations at Plymouth is not due to any lack of willingness on the part of Chrysler Corp. to do business with the UAW," Weckler said, "it is due entirely to the controversy within the UAW itself."

Announcement by John L. Lewis that the CIO would excommunicate all UAW locals sending delegates to the convention called by Homer Martin, embattled leader of the opposing faction, in Detroit, on March 4, indicates the serious concern that labor leaders are showing over the bitter struggle for control of the huge automobile workers' union.

Although claiming a constantly increasing lead over Martin in the campaign for support of UAW locals, the CIO contingent is continuing an intensive drive in territories where Martin's strength is greatest. According to reports there are more CIO organizers at work fighting Martin than there ever were to help UAW when automobile labor was being organized.

As the struggle for control entered its final rounds the CIO faction, led by R. J. Thomas, was claiming support of locals representing more than 286,000 out of a total membership of 375,000, while Martin in his latest radio appeals was claiming support of more than 200,000.

## Tom Moss Replaces J. D. Burke at Dodge

The appointment of Tom W. Moss as director of Dodge truck sales to succeed J. D. Burke, resigned, was announced this week by Forest H. Akers, vice-president and director of sales of the Dodge Division of Chrysler Corp.

Mr. Moss, who for the past five years has been general service manager of the Chrysler Corp. in direction of the corporation's service activities relating to Plymouth, Dodge, DeSoto and Chrysler divisions, assumed his new duties immediately.



## • • • Unequalled SURFACE SMOOTHNESS and SPHERICITY

The series of lapping operations performed as a matter of course in the Strom plant give Strom Steel Balls a degree of surface smoothness and sphericity that has always been unequalled in any other regular grade of ball. Only through such unique lapping practice can extreme precision be obtained.

Physical soundness, correct hardness, size accuracy, and sphericity are guaranteed unconditionally in all Strom Balls.

Other types of balls—stainless steel, monel, brass and bronze—are also available in all standard sizes. Write for catalog and prices.

**Strom**

**STEEL BALL CO.**

1850 So. 54th Avenue, Cicero, Ill.

*The largest independent and exclusive Metal Ball Manufacturer*



**A. N. BENSON**

... who has resigned as general manager of the National Automobile Dealers Association.

### Benson Resigns N.A.D.A. Post

A. N. Benson, general manager of the National Automobile Dealers Association, announced his resignation on Feb. 22 to take effect immediately. The resignation was accepted by the N.A.D.A. executive committee.

Prior to his affiliation with the N.A.D.A., Mr. Benson served for 12 years as general manager of the Minnesota Automobile Dealers Association. He joined the N.A.D.A. executive staff on March 1, 1936, and in April of that year was made general manager. No announcement of his future plans has been made.

Pending appointment of a new manager, W. E. Blanchard, assistant general manager, will serve as acting manager.

## Men

Thomas F. Laughlin, with Studebaker for the past 24 years, chiefly on the Pacific Coast, has been made assistant sales manager to C. Scott Fletcher with headquarters in South Bend. Laughlin was formerly regional manager of the Studebaker Pacific Corp. in Los Angeles. Another new appointment is that of Courtney Johnson as regional supervisor with temporary headquarters in Chicago.

Frank Van Eiszner, for the past four years sales promotion manager in Philadelphia for Roche, Williams & Cunningham, Studebaker's advertising agency, has been appointed district sales manager for Studebaker with headquarters in Philadelphia.

Henry S. Beal, formerly of Chicago, has become associated with The Heald Machine Co. in the position of general manager. Mr. Beal was manager of Jones & Lamson Machine Co., Springfield, Vt., and served the National Machine Tool Builders' Association as president. More recently he has been president of Sullivan Machinery Corp., Chicago.

L. E. Ulrope, regional manager of sales, has been elected a vice-president and director of the Colonial Beacon Oil Co.

Harold Glenn Moulton, president, The Brookings Institution, Washington, D. C., is to be the featured speaker at the preview dinner preceding the opening of the Machine and Tool Progress Exhibition in Detroit on March 13.

C. M. Eason was elected president, E. R. Estberg, treasurer, and John J. Pfeffer, secretary of the Industrial Clutch Co., Waukesha, Wis., at the annual meeting this month.



### ONLY LAPPING As Strom Does It CAN PRODUCE SUCH PRECISION

Strom Steel Balls possess a degree of surface smoothness and sphericity that has never been equalled in any other regular grade of ball. Such precision is exclusive with Strom because it can be attained only through a series of lapping operations such as are standard practice in the Strom plant.

Physical soundness, correct hardness, size accuracy and sphericity are guaranteed in all Strom Balls.

Other types of balls—stainless steel, monel, brass and bronze—are also available in all standard sizes. Write for complete details.

**Strom STEEL BALL CO.**

1850 So. 54th Avenue, Cicero, Ill.

*The largest independent and exclusive Metal Ball Manufacturer*

# Advertising

F. A. Berend, advertising manager, Pontiac Motors division, General Motors Corp., announced an additional expenditure of \$936,000, to be spent in March, April, and May. This augments the largest advertising outlay of the company in five years.

June & Co., a new advertising agency with offices in the General Motors Bldg., Detroit, has been organized by Robert and John D. June. Among the new

agency's accounts are Alma Motor Co., four-wheel units; Clipper Belt Lacer Co.; Federal Back-Up Signal Co., automotive specialties; Hill Diesel Engine Co., and United Engine Co.

The much-discussed \$300,000 advertising campaign of the Air Transport Association of America, Chicago, has been awarded to Erwin, Wasey & Co. Homer McKee, veteran advertising man, has been named head of the firm's Chicago office. Roger M. Combs, Jr., is the account executive. He was formerly sales promotion manager of American Airlines.

Stanley Pflaum Associates, Chicago,

has been appointed advertising counsel by General Finance Corp., automobile financing company.

National Trailways System, an association of 37 bus lines with headquarters in Chicago, has named Needham, Louis & Brorby its agency, with Erwin Miessler account executive.

Loyola Guerin, in charge of planning and coordination of market research, sales promotion, and advertising policies of G. M. Basford Co., New York, has been appointed assistant to the president. He was formerly with General Motors Corp.

Harold Golden, who some years ago was connected with automotive accounts, has joined Mason Barlow & Associates, Chicago.

Griffes & Bell, New York agency, which had among other accounts the Briggs Clarifier Co., Washington, D. C., has suspended its business.

An extensive campaign of Johns-Manville Corp. on factory and plant insulation has been launched through J. Walter Thompson, New York.

General Tire & Rubber Co. has upped its appropriations for a campaign to start in March, the D'Arcy Advertising Agency, Cleveland, announced.

"Our 1939 advertising appropriation, which is one of the largest in the history of the Perfect Circle Co., represents the first step in our movement to promote greater safety on the highways and at the same time to broaden the piston ring market. Heretofore, piston ring advertising merely emphasized the need of stopping oil pumping, and while this is still one of the fundamental purposes for which rings are installed, we feel that our advertising should be directed more to those motorists whose cars have lost their original efficiency." So stated G. W. Stout, the company's advertising manager, in announcing its new campaign. Heading the list of national publications to be used this year are *The Saturday Evening Post* and *Country Gentleman*. A heavy trade paper schedule has also been approved, according to Mr. Stout.

Sales executives of United Motors Service and service engineers of the Delco Brake division of General Motors will hold meetings at all United Motors Service branches, starting at the Detroit branch Feb. 25 and continuing through April 16. These meetings are to introduce to the trade the 1939 merchandising program on Delco Brakes. H. B. Smith, merchandising manager of Delco Brakes for United Motors Service, assisted by Frank Plovick and Robert Curry, will conduct the meetings.

Fruehauf Trailer Co., assumes the role of Saint George in a one-company campaign to offset recent claims by railroads that trucks are causing their ruin. The theme is the truck's place in the national economy.

## ALTINIZING..



## A McQuay-Norris Development Has Become a Trend

Altinizing is an electrolytic deposition of tin on the wearing surface of a piston ring. It prevents scuffing during the initial running in of the engine thereby improving performance and increasing ring life.

*Send all inquiries to  
McQuay-Norris, St. Louis, Missouri*

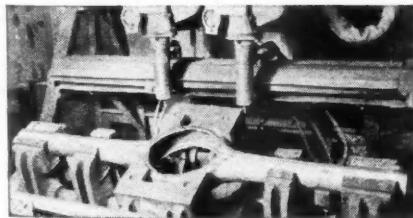
**McQUAY-NORRIS  
MANUFACTURING COMPANY  
ST. LOUIS, MO.**

You too can cut the cost of  
**REAR AXLE HOUSINGS**  
 with the "Electronic Tornado"

**HERE'S HOW—**

Automotive plants and their fabricators are now using the Lincoln "Electronic Tornado" for the fabrication of rear axle housings (and many other automotive parts) because of the following cost-cutting advantages:

**1.** First installation cost for this simplified and compact automatic carbon arc welding equipment is low.



In this plant, the Electronic Tornado welds rear axle housings complete in 43 seconds. The completed housing in the fixture is shown.

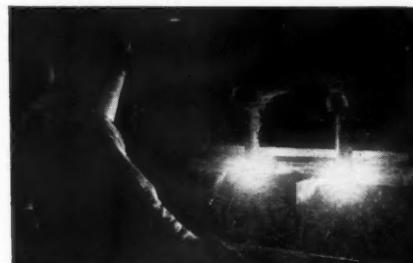
**2.** Material costs are minimized because no metal is added and none is burned away.

**3.** Cost of expendable materials (carbons, flux and electric power) used in this process is low.

**4.** The finished weld is smooth and clean. No grinding is necessary.

**5.** Produced by the "shielded-arc" process, the weld is consistently of uniform high quality—eliminating repairs or rejects.

**6.** When changes in models or designs are made, the "Electronic Tornado" can be adapted to the modified or new



"Electronic Tornados" are used extensively for production of axle housings, mufflers, torque tubes, starter and generator frames and other automotive parts.

welding fixture at a saving in cost.

You too can secure these benefits. The nearest Lincoln office, experienced in the application of the "Electronic Tornado" to automotive parts and problems, is at your service. Call them in today. No obligation.

*Largest Manufacturers of Arc Welding Equipment in the World*

**THE LINCOLN ELECTRIC COMPANY**  
**DEPT. KK-578** **CLEVELAND, OHIO**

# Goodyear Spends \$400,000 For Centennial Celebration

**Tire Company Presented Akron with Statue Of Discoverer of Vulcanization Process**

The centennial of Charles Goodyear's discovery of the process of rubber vulcanization was observed with a city-wide Akron celebration sponsored by the Goodyear Tire & Rubber Co., Feb. 23, when the company presented the city a large statue of Charles Goodyear,

erected in a new civic mall facing the Akron Municipal Building. At a banquet attended by more than 1600 at the Akron Armory following the dedication of the statue and mall, Gov. John W. Bricker of Ohio spoke, both national radio networks carrying his

message over their entire systems.

The Goodyear centennial coincided with the Goodyear company's fortieth anniversary and home coming, for which it brought more than 2000 officials to Akron from all parts of the world. The entire celebration is said to have cost Goodyear approximately \$400,000.

Gen. Hugh S. Johnson addressed the Goodyear home coming rally, Feb. 21, at the Goodyear gymnasium which has been converted into a miniature world's fair of rubber. Special tributes were paid to F. A. Seiberling and C. W. Seiberling, founders of Goodyear and president and vice-president for many years of that company. Both are now officials of the Seiberling Rubber Co. P. W. Litchfield, F. A. Seiberling's first factory superintendent at Goodyear, now is Goodyear's president and chairman.

Preceding the Akron celebration, the City of Woburn, Mass., where Charles Goodyear made his discovery in 1839, staged a Goodyear centennial program Feb. 17, C. W. Seiberling presenting the city with a Goodyear memorial plaque on behalf of the Goodyear company and the City of Akron.

## There are *billions* of starts behind a BENDIX DRIVE



**A** MIGHTY impressive record stacks up behind the Bendix Drive. One of the world's most widely used automotive units, it has been faithfully starting millions of cars automatically many times a day for many years.

The Bendix Drive is simple, reliable and virtually trouble-proof. At the touch of a starter button, it takes hold—starts the engine—lets go—and then protects the starter from damage by unintended operation.

Car owners take such dependability somewhat for granted. But there's a lot behind that unfailing service... a lot of experience in knowing how to build right and sticking to the strictest specifications in materials and workmanship.

Bendix Drive is built in sizes and types to start every kind of automobile, marine or Diesel engine.

**ECLIPSE MACHINE DIVISION  
BENDIX AVIATION CORPORATION  
ELMIRA, NEW YORK**

ing weeks picking up the slack.

Sales currently are reflecting seasonal influences although they are averaging about the same percentage over February last year as they did in January.

Ford's total for the week, including Mercury and Lincoln-Zephyr was down somewhat with some divisions operating on a four-day schedule instead of five days, and the Chrysler total also was down because of a labor dispute between UAW factions which closed down Plymouth completely for part of one day and permitted operation of only one assembly line instead of two on the next. Aside from a slight downward revision at Cadillac-LaSalle, General Motors divisions maintained approximately the pace in effect throughout February. Graham was expected to complete about 200 cars this week and Willys plants also were in partial production. Packard, Hudson and Nash expected to continue on their present basis while Studebaker was off about 1200 units for the week.—J. A. L.

## Maryland Car Dealers Vote Against Licensing

Car dealers of Maryland voted not to support proposed dealer licensing legislation at a state-wide meeting of the Automobile Trade Association of Maryland, in Baltimore, on Feb. 21.

Representative Ruth Shoemaker has placed before the state legislature a bill licensing new and used car dealers and their salesmen, and prohibiting the

## Acknowledgment

In this, the 21st Annual Statistical Issue of AUTOMOTIVE INDUSTRIES, we have attempted to show in logical sequence the production, export, sale and registration of motor vehicles throughout the world. In addition are shown the design features of vehicles and engines of every description used in transportation on land, water and in the air. Some additions and deletions have been made in the material shown in previous similar issues. For the first time in many years we do not give any foreign specifications of passenger cars, aircraft or Diesel engines. We hope, however, to be able to bring this interesting feature back into the magazine just as soon as political and economic conditions in foreign countries are more stable.

To all who so willingly cooperated with us in supplying source material for the various tabulations in this annual statistical issue, our sincere thanks and appreciation. Without their aid we would have been unable to present this comprehensive picture of the industry.

Particular thanks are due the motor vehicle commissioners of the various states, to G. C. Thornburgh, vice-president, R. L. Polk & Co.; I. H. Taylor, chief, Automotive-Aeronautics Trade Division, Bureau of Foreign and Domestic Commerce, and George Quisenberry, editor, *The American Automobile* (Overseas Edition) and *El Automovil Americano*, export affiliates of AUTOMOTIVE INDUSTRIES.—M. A.

practice of "wilful and habitual over-allowances in used car trading." In the secret ballot, asking dealers' favor regarding the proposed law, the vote was negative by a close margin.

## Natchez Builds Tire

### Plant for Armstrong

The Armstrong Tire & Rubber Co. will open a new \$300,000 automobile tire factory in Natchez, Miss., March 1. It was built by the city of Natchez, marking the latest development in Mississippi's program to "balance agriculture with industry."

Construction of the new Natchez factory, warehouse and offices was financed by a \$300,000 municipal bond issue, and the plant leased to the Armstrong Company. The city also provided water, sewerage and road facilities. The Armstrong Company agreed to install at least \$500,000 worth of equipment, insure the plant, and keep it in good repair. The company is to pay \$50 a month rent for a period of five years. At the end of the five-year lease period it may purchase the plant, which then goes on the tax rolls.

The factory promises a \$2,500,000 payroll for the five-year period, exclusive of executive salaries, with the proviso for a 10 per cent payment to the city on any deficiencies in the payroll. The plant will supply the municipality with tires for city-owned automobiles.

Municipalities in other states have within recent years offered tax exemption and other inducements to secure industries, but Mississippi cities are

the first authorized to finance directly. The tire factory is Natchez's second venture under the industrial program.

## Financing in December Increased 8.6 Per Cent

Dollar volume of retail automobile financing for December, 1938, amounted to \$99,419,283, an increase of 8.6 per cent when compared with November, 1938, an increase of 9.6 per cent as compared with December, 1937, and a decrease of 32.9 per cent as compared with December, 1936, according to a report issued by the Department of Commerce, Bureau of the Census. The vol-

ume of wholesale financing for December, 1938 amounted to \$163,508,239, an increase of 25.1 per cent when compared with November, 1938, an increase of 17.6 per cent compared with December, 1937, a decrease of 11.9 per cent compared with December, 1936.

Wholesale financing reported for the year 1938 amounted to \$990,942,919, a decrease of 47.5 per cent as compared with 1937, and a decrease of 41.8 per cent as compared with 1936, and the volume of retail financing amounted to \$1,010,864,033, a decrease of 41.3 per cent as compared with 1937, and a decrease of 41.1 per cent as compared with 1936.



"It's the best of the Bessemers," say production men who have standardized on Ultra-Cut Screw Stock since "way back when."

On performance alone, this high-sulphur grade of Bessemer Cold Finished Steel is a tribute to the development work of B & L engineers and to the closely controlled methods of manufacture in B & L mills.

You will find it "built to order" for a great variety of fabricated automotive parts. It is ideal for modern types of high speed automatics, particularly for intricate machining jobs where a smooth, bright finish and clean cut threads are all-important.

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# Tokyo Frowns on Plans to Build Motorcar Industry in Manchuria

## Japanese Ministry Sees Market Threatened If Giant Plant Is Constructed on Continent

The idea of building up a separate motorcar industry in Manchuria has finally lost favor with officials of the Department of Commerce and Industry in Tokyo, according to the *Nikkan Kogyo Shimbun*. The ministry is believed rather to have urged Yoshihiko Aikawa, president of the Manchuria

Industrial Development Corp., who once announced a plan to build a giant automobile plant in Manchuria with the financial assistance of American motor interests, to be satisfied with the progress of Japanese plants, two of which he controls.

The ministry is understood to have

particularly discouraged Mr. Aikawa's plan to draw the Ford Motor Company into the scheme. If anything on the scale envisaged by Mr. Aikawa were attempted in Manchuria, the Japanese industry, which is placing great hopes on the continent as a market, may run into difficulties once normal conditions are restored and military orders peter out, Mr. Aikawa was reportedly told. Nevertheless the much-mooted automobile scheme has bobbed up again as Mr. Aikawa has recently dispatched several executives of his concern to the United States, apparently to contact Ford officials.

## C.O.E. Standard

The Bill for Military Inspection of Motor Vehicles, now under discussion in the Diet, calls for unification of truck models, especially in respect of body design, in accordance with defense requirements. It is expected that in future all Japanese-made motor trucks will be cab-over-engine models, which have found particular favor with the defense authorities. In fact, all Toyota and Nissan trucks supplied to the Army since the outbreak of the current hostilities were C.O.E.'s.

Under the projected law the defense headquarters may also repeal a ministerial decree of 1936, setting certain limitations on the maximum floor height and clearance of buses. The result of this decree was that the frame of truck chassis was also lowered, making them unsuitable for military use.

## Ikegai Makes Fuel Pumps

The Ikegai Automobile Industry Co. has spent \$540,000 on equipment to produce fuel pumps for automotive Diesel engines.

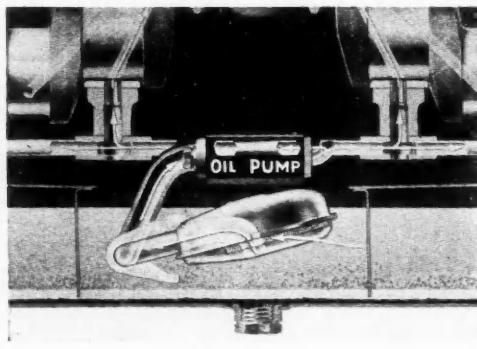
Negotiations are reported pending between Japanese military authorities and representatives of the Robert-Bosch-A.G., Germany, with a view to obtaining for Japanese automotive manufacturers licenses on Bosch fuel injection equipment for Diesel engines.

## Movable Headlamps

The Tanaka Iron Works has produced samples of a novel automobile headlamp unit invented by a Shizuoka insurance salesman. The unit is connected to the steering column so that on turning the headlights swing automatically into a parallel axis with the front wheels, affording full visibility in taking curves. The direction of the headlights may also be changed manually from the steering wheel, both laterally and vertically, to suppress glare in passing oncoming cars and for reconnoitering in peace and in war.

## Parts to Morocco

Several automobile dealers from Morocco have recently visited Japan and let contracts for a substantial quantity of Japanese-made Chevrolet



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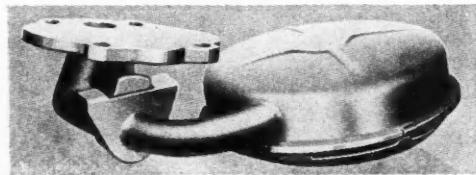
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The sludge, filings, and heavy abrasives which cause serious engine wear and inefficiency naturally precipitate to the bottom of the crank case. FLOAT-O installed at the pump intake, draws horizontally from the clean oil found at the top—it does not disturb the harmful substances found at the bottom of the crank case. With FLOAT-O only this "cream" of the oil sump is distributed to the bearings. This is true during starting and all running conditions. FLOAT-O is also a definite guarantee against ice locking.

Indorsed and approved by the leading research engineers of the industry, FLOAT-O insures quicker starting, smoother operation, and longer life for engines.

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parts, the *Nikkan Kogyo* reports. The paper expresses doubt, however, whether Japanese parts makers will be able to hold their own in view of the fast rising cost of raw material and labor. The sales to Morocco are said to have been made at a sacrifice.

### Car Prices Up

Japanese branch plants of Ford and GM have revised list prices of cars and trucks in sympathy with higher quotations by local manufacturers.

Japan's lowest priced baby car, the "Datsun," now sells at Y2,550 (\$700), an increase of Y550 over 1937.

### Absorbs Motor Firm

The Tachikawa Aircraft Co. has bought up the Highspeed Engine Industry Co., which once turned out "Ohta" small cars. Tachikawa is using the plant to produce aircraft parts. Highspeed Engine found it unprofitable to continue the production of baby cars because of the severe restrictions recently placed on raw materials for the construction of such cars.

### Toyota 1939 Truck

The Toyota Automobile Co. has announced a new truck model, which has a wheelbase of 3909 mm and is powered with a straight six-cylinder gasoline engine whose cylinders have a bore of 84 mm and a stroke of 102 mm, making the total displacement 3390 cc. The engine is rated 75 hp. at 3000 r.p.m., operating at a compression ratio of 1 to 6. As in previous models, Toyota builds the engines with overhead valves. The transmission of the new truck provides four forward speeds and one reverse. The new truck is listed at Y5,200 (\$1,425).

### New Swedish Plant For Trucks-Buses

Automobilfabriken Thule, Koping, Sweden, has announced that it has erected a new plant in Soderham (in Northern Sweden) where trucks and buses will be manufactured. According to the present plans, reported by the Department of Commerce, 100 truck and bus chassis will be produced in 1939. The chassis and various heavier parts are made by the company, while the engines and smaller parts are either imported or purchased locally.

The trucks are made in two models, the report stated. The lighter chassis, intended for a load of four tons, will be available in three wheelbases and powered with a 6-cylinder American gasoline engine. The larger truck chassis, of 5-6 tons, or the bus chassis for 40-50 passengers, is equipped with either gasoline or diesel type engine of American manufacture.

It was said to be the opinion of the trade that this make will have little influence on the sales of American trucks and buses in Sweden. However,

as the size of both the trucks and buses correspond to the Swedish "scania-Vabis," it may compete actively with this make.

### Studebaker Observes Its Eighty-seventh Birthday

Without fanfare or special events, the Studebaker Corporation on Feb. 16 celebrated its eighty-seventh birthday. Paul G. Hoffman, president of the corporation, in a statement to a party for fathers and sons employed by the company, said that the average length of employment of men now on the payroll

is 11.06 years and that the present force of Studebaker workmen represents 72,652 years of service.

The firm was established Feb. 16, 1852 by Henry and Clem Studebaker under the name of H. & C. Studebaker, Blacksmiths and Wagon Builders. Henry, aged 26, and Clem 21, started with a capital of \$68 and two forges. Studebaker now is a \$30,000,000 company owned by 25,021 stockholders and employs 6760 while its 2595 dealers employ 13,235. The company built its first "horseless carriage" in 1902 and in 1904 production of gasoline motor cars began on a volume basis.

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Preloaded double-seal ball bearings: 16 tooth splined spindle: Table-Raising gear: Head-raising gear: Tilting or production table: Completely enclosed belt: Safety spring wind: Foot power feed. Overall dimensions 66" high; 18" wide; 27" front to rear. Tilting table 11" by 12". Production table 12 1/2" by 17" surface. Floor base 10" by 13 3/4" table surface. Shipping weight 340 lbs. Separate drill press heads available. Also high speed bench models and 2 spindle models.

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Gentlemen: Please send me the new 1939 Catalog.

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## Golden Gate Exposition

(Continued from page 254)

wool and mohair. About the walls are dioramas showing the source of some of these materials such as iron, coal, zinc, aluminum, cotton and soybeans, the principal manufacturing operations on each and a representation of the parts of a complete car formed by each.

Off the entrance horseshoe is the main exhibit hall where there is a wide display of manufacturing processes, inspection and testing exhibits, includ-

ing the Ford-built Johansson gages, a revolving chassis, an operating model of the by-products section of the Ford Rouge plant at Dearborn, Mich., a model service station and a demonstration of motor assembly are on exhibit.

A part of the display is an exhibit sponsored by the Champion Spark Plug Co. showing the manufacturing processes of its product. Also in the main exhibit hall is the Firestone Tire and Rubber Co.'s exhibit which produces

small, all-rubber miniature Ford V-8 cars. The major steps in the manufacture of rubber products is shown.

In a darkened room just off the main hall there are demonstrations of the stroboscope which enables engineers to study a speeding engine by arresting its motion. The weatherometer and the fadeometer, used for testing weather and sunfast qualities of upholstery and finishes, are demonstrated. The dark room also shows a popular representation of the fourth dimension and an exhibit showing the fallacies of the theories of perpetual motion.

Chrysler Corp. has an extensive display exhibiting the company's complete line of passenger cars including Dodge, DeSoto and Chrysler; its Plymouth and Dodge commercial cars; its Dodge trucks and also the Airtemp, air-conditioning and heating equipment.

Occupying the greatest amount of space of any single exhibitor in the Vacationland Building is the General Motors "Progress on Parade" exhibit under the management of David P. Harr.

The exhibit can be located from nearly every section of the building by its outstanding twin pylons which tower 50 ft. in height from the center of the exhibit area. The base of one of the pylons houses a "Hall of Science" consisting of a specially constructed stage with complete theatrical effects. The entire modernistic enclosure structure, colorful with Lumiline lighting, displays a color scheme of Imperial Dragon Red and the Sun of Dawn Yellow. The exhibit area is enclosed by a low garden wall with impressive entrances on two sides and at the four corners.

The romantic saga of progress in American automotive industry, and the contributions its great research laboratories have made is the idea back of the General Motors exhibit. This display was conceived and built under the direction of Charles F. Kettering and designed to take its audience behind a modern research laboratory. This display is under direction of Robert Strauss of the General Motors Parade of Progress Caravan, a mobile circus of science that has been visited by millions of persons in the United States, Canada and Mexico.

Outstanding feature of this exhibit is what happens inside the cylinder of a gasoline engine, demonstrated by means of a transparent engine constructed of the simplest parts. The mysteries of internal combustion are revealed by this demonstration.

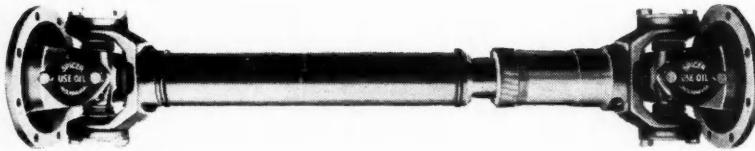
In addition to the elaborate research show of continuous performances, "Progress on Parade" includes a display of Chevrolet, Pontiac, Oldsmobile, Buick, Cadillac and LaSalle cars, with an exhibit of the various General Motors truck lines.

A Diesel engine and generator exhibit weighing 42,000 lb. and similar to the engines which power the railroad streamliners complete the General Motors exhibit.



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Needle bearing  
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• The 1939 Spicer "Needle Bearing" universal joint has the traditional high load capacity, low friction, low operating temperatures and high efficiency in which Spicer joints have been outstanding.

The proved design insures satisfactory performance. The importance of RELIABILITY is recognized by engineers of leading automotive manufacturers who specify the Spicer universal joint.

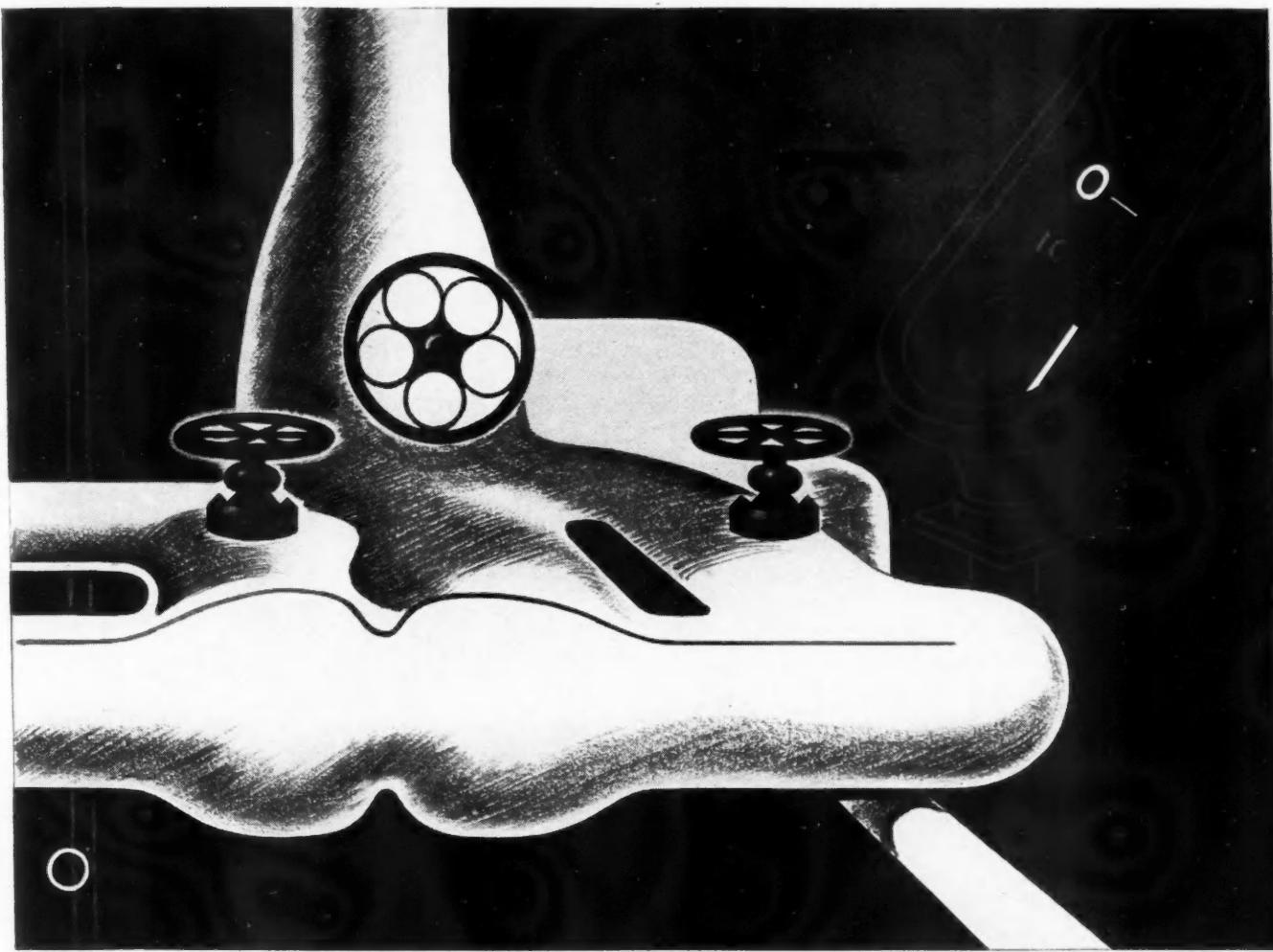
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Our technical books "Molybdenum in Steel" and "Molybdenum in Cast Iron" which contain a great deal of practical data are free to any interested production executive or engineer on request.

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# Books

*La Tecnica del Disegno delle Macchine (The Technique of Machine Design)*, by Dr.-Ing. Mario Tessarotto. Published by Ulrico Hoepli, Milan.

This is elementary work on machine design intended for use as a text in technical and industrial schools. It deals with drafting-room conventions, materials of construction and their properties, metal-working processes, sketching and mechanical drawing, standards relating to machine elements,

and the strength of joints (or connections) and of shafts. In the last two chapters, methods of calculating strength are explained and illustrated by examples. Most of the examples of machine parts illustrated are taken from the automotive and aircraft fields. In an Introduction by Giuseppe Belluzzo it is pointed out that the bases of modern design are quite different from those of the past century; speeds and pressures have increased greatly, and to the ordinary static stresses have been added stresses due to vibration and fatigue. On the other hand, high-strength materials have been introduced, the high strength being due to

alloying and to heat treatment. All these changes created a demand for a small volume on the principles of modern design, and the volume under review is offered to meet it.

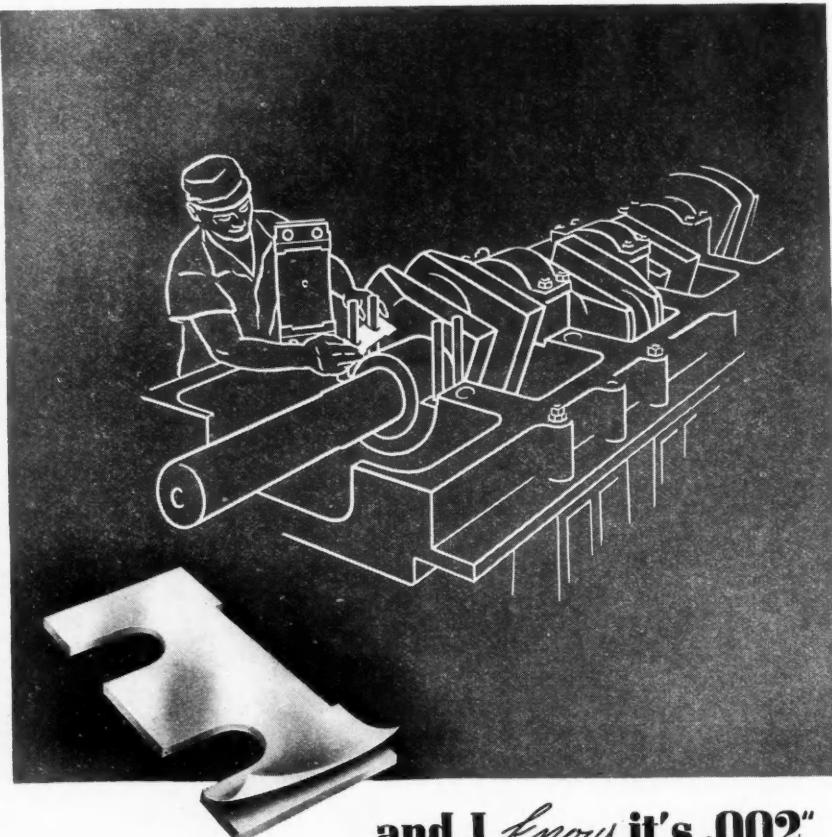
*Patent Tactics and Law—What the Industrial Executive and Engineer Should Know About Patents*, by Roger Sherman Hoar. Published by the Ronald Press Company, New York.

This book, which is a new edition of an earlier volume that appeared under the title "Patents," is intended to be a treatise on patent tactics and to translate into plain English so much of the patent law as will enable an industrial executive or engineer to understand the company's attorney when discussing a patent problem, and to cooperate fully with him. It is based on long experience in corporate patent practice and contains a great deal of information that should be helpful to executives whose firms are engaged in the manufacture of patented articles. Patent practice is covered in detail, not only as regards that of the U. S. but the practices of numerous other industrial countries as well. One chapter dealing with the organization of a patent department and another with the interpretation and validity of patents should be of particular interest to executives.

*Diesel Engineering*—by John W. Anderson, McGraw-Hill Book Co., 269 pp., \$3. This is the first edition of a book on the principles of Diesel engine design intended as a textbook for engineering colleges. Its author, as manager of engineering, Diesel engine division, American Locomotive Co., is in excellent position to develop the subject in well rounded fashion from the perspective of the latest available information on Diesel engine developments.

The text material places special emphasis on the principles of thermodynamics, on the mechanics of engine design, on the principles of installation, as may be noted from a listing of a chosen group of chapter headings, e.g., cycles, fuels, combustion, combustion chambers, fuel injection, cooling, lubrication, engine design, installation principles.

Valuable characteristic of this textbook, and one which should appeal to the student as well as the practicing engineer, is the reference to current engineering literature in many important sections. Not only does this treatment provide a background of authority but, what is of equal importance, it clothes the book with an up-to-dateness so essential in dealing with a subject still in a state of flux and practical development.



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• The assembly mechanic knows his LAMINUM

shims. He knows that each of the .002 (or .003) inch thick laminations he *peels* from this brass shim, will leave a smooth, hard surface and absolutely uniform thickness. He can be sure of a quick precision adjustment—right at the job. No filing, grinding, machining. • Do you wonder that best-known machine manufacturers throughout industry . . . and leading aircraft builders . . . profit by LAMINUM convenience and cost-cutting in assembly or repair? • We supply Laminum shims cut to your exact specifications. For maintenance use, Laminum sheets are obtainable from your mill supply house.

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bearings in which LAMINUM  
shims find application. For  
handy practical use. With it  
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## Exit the Austin Seven, Enter the Austin Eight

After being for nearly 20 years the "best-seller" among the range of Austin cars, the Seven—referred to as

the "Baby Austin"—is to go out of production. It is being superseded by an entirely new model, to be known as the Eight.

The car closely resembles the Ford and Morris Eights in wheelbase and track and in piston displacement. It has conventional half-elliptic springs—again like the Ford and the Morris—but has a smaller piston displacement than the Standard Eight (900 cc against 1021 cc) which is distinctive among British cars of this type in having independent front suspension.

The new Austin also displaces the Big Seven introduced at the Earls Court show of 1937 to provide for roomier four-passenger bodywork.

pared a special issue of its house organ, *Oakite News*.\*

E. F. Houghton & Co., Philadelphia, has issued a folder on the subject of transmission **leather belting**.\*

"Nigrum" impregnated **hardwood bearings** are described in a leaflet issued by the Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.\*

Niagara Machine & Tool Works, Buffalo, N. Y., has prepared a new bulletin covering its series BL, 10-page **power squaring shears**.\*

The Eclipse Air Brush Co., Inc., Pneumix division, Newark, N. J., has issued a data folder on the performance of its **air-motored agitators** in laboratories and industrial plants.\*

**National Labor Relations Board**, division of Economic Research, has issued the fol-

lowing pamphlets: "Union-Employer Responsibility" by Lyle Cooper; "Effective Collective Bargaining," by David J. Saposs and Lyle Cooper; and a "List of References on National Labor Relations Board" compiled by Bernard W. Stern.\*

A picture book of ideas for handling various products mechanically on **overhead conveyors** has been published by Link-Belt Co., Chicago.\*

The Harnischfeger Corp., has announced the completion of bulletin C-6 "Industrial Cranes," which covers completely the design and application of the line of P & H Industrial Cranes for general usage in industries the world over.\*

\* Obtainable from editorial department, AUTOMOTIVE INDUSTRIES. Address Chestnut and 56th Sts., Philadelphia.

## Metal Markets

(Continued from page 252)

per cent, compared with 54.8 per cent in the preceding week, is nevertheless attributed to the gap in shipments to consumers occasioned by the holiday.

In the copper market there is more hope that a pick-up in foreign demand will bring about healthier conditions. At one time the export price dipped below 10 cents, but at the opening of this week's business it had recovered slightly, with some business booked at 10.10 cents. News from Washington that Congressional leaders had agreed to continue the present 4 per cent import tax also encouraged producers and custom smelters. They continue to quote spot electrolytic at 11½ cents, but in the outside market metal was offered at 10.45 cents on Monday.

Spot Straits tin was offered at 45½ cents at the beginning of the week.

Following a \$2 per ton reduction in the price of lead, storage battery manufacturers came into the market, which after a spell of dullness, turned active. —W. C. H.

## Publications

"Work Done on the Blanchard" is the title of an unusually interesting brochure brought out by the Blanchard Machine Co., Cambridge, Mass. Photographs and text are intelligently presented to illustrate and describe typical examples of the machining and finishing of flat surfaces by **Blanchard grinding**.\*

The Tinius Olsen Testing Machine Co.'s newest machines for testing plastic materials are described in the company's bulletin No. 17.\*

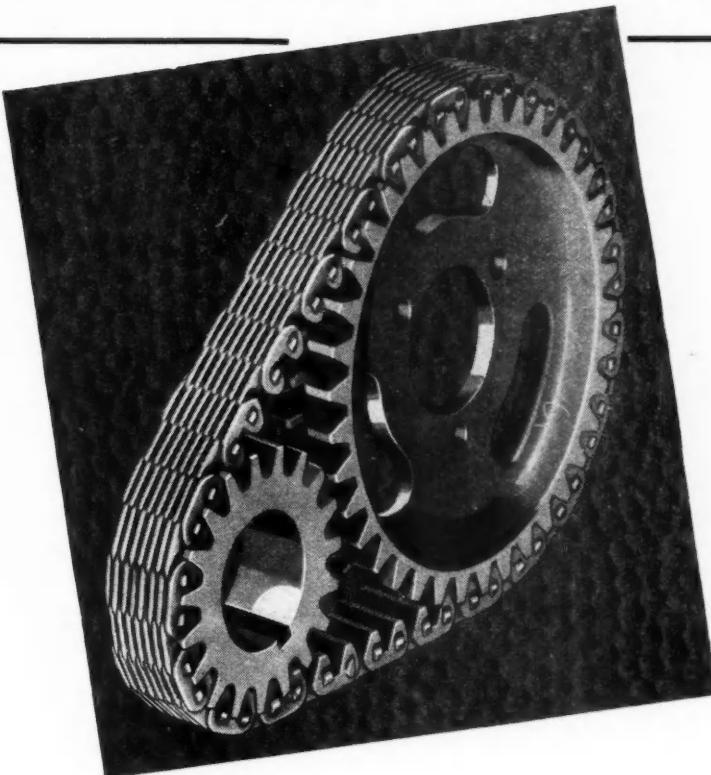
A new switchboard-model **temperature indicator** with self-contained toggle-type switches for connecting any one of a number of couples to the measuring circuit is described in a catalog issued by Leeds & Northrup Co.\*

A folder published by Rinck-McIlwaine Inc. describes a number of new **Rimac tools**.\*

The South Bend Lathe Works has published a 32-page catalog announcing the new model 9-in. **workshop precision lathe**.\*

Commemorating three decades of service to industry as originators and producers of industrial cleaning methods and materials, Oakite Products, Inc., New York, has pre-

## ...the result of carefully coordinated engineering study



**I**N all the years since Morse Silent Chain drives were first used, no other principle has been found that combines so many desirable performance features. This has been

accomplished through the work of leading motor car engineers, coordinated with our own engineering research.

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**MORSE SILENT TIMING CHAINS**  
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## Tools of Tomorrow

### Center Finder

*... For tool and jig work with various vertical machines*

A handy and inexpensive tool has been developed by the L. S. Starrett Co., Athol, Mass., for jig and tool work in milling machines, drill presses and similar vertical machines where it is necessary to locate working points with considerable accuracy. It consists of

a spring-tensioned pointer held in a tapered shank with the pointer free to "wiggle."

With the center finder set in the chuck or tool holder of the machine and the pointer guided to true concentric, it is said to be a simple matter to bring the working point of any job into perfect alignment with the machine spindle. The tension of the spring which bears on a ball on the end of the pointer can be adjusted by a screw in the



Starrett center finder

back of the shank. This spring cushions the pointer and protects it against damage or distortion if the center finder is brought into too firm contact with the work. The pointer can be telescoped into the body when not in use.

**A CYLINDER** bore, even though it has a beautiful, lustrous surface, may still be unacceptable. It may also be slightly out of round, tapered or snaky. It may not be within required diameter tolerances, or it may have surface metal defects produced by preliminary machining or heat treating operations.

**MICROFINISH** is the one process that accomplishes final control of all these factors:

*It corrects errors in roundness, straightness and taper.*

*It offers accurate control of bore diameter.*

*It provides a means for the removal of sufficient stock to eliminate surface metal defects.*

*It produces any degree of smoothness desired.*

*Write for complete details.*

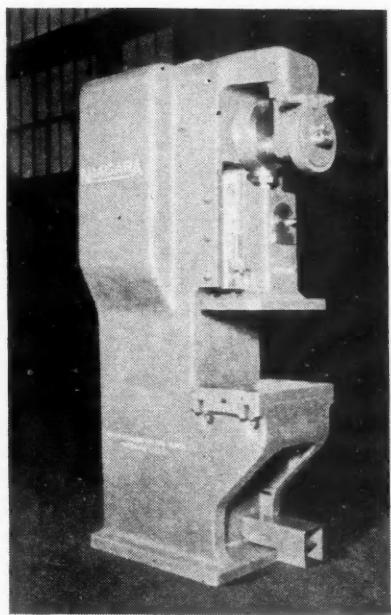


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February 25, 1939

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*Automotive Industries*



Newcomer to the series of presses built by the Niagara Machine & Tool Works, Buffalo, N. Y., is this stream-lined punch press. Gearing, clutch, flywheel, V-flat drive and motor are all enclosed within the frame

(Please turn to page 278 for other new product descriptions)

### Chicago Motor Coach To Buy Diesel Buses

Authorization recently was given to the Chicago Motor Coach Co. by the Illinois Commerce Commission to spend \$640,531.50, for 50 Diesel-powered buses.

The operation of these buses is largely experimental and the company will be ordered to install gasoline engines in the new coaches if the Diesel-powered jobs are not satisfactory.

Commission engineers said the recent demonstration of a Diesel-powered bus showed less noise in operation compared to the gasoline-powered vehicles, complete absence of carbon monoxide gas, and smoother starting and stopping.

# Today's Cars Are Longer Lived

(Continued from page 202)

As a check against actual existing conditions it is interesting to see just how closely this estimated cars-in-use compares with an actual count just completed by R. L. Polk & Co., as of July 1, 1938. The total at that time was 23,538,036 passenger cars which, we feel justified in comparing directly with our estimate as of Oct. 31, 1938, of 23,350,152, a difference of less than one per cent. We are making this direct comparison even though of slightly different periods because of the fact that all evidence points to the conclusion that all cars are being eliminated from use at about the same rate they are entering into service.

While some might not consider it to be statistically correct to assume that all makes of cars have the same life curve, we have taken the liberty of making that assumption and present in Table 4, below, our Estimate of Cars in Use by Makes as of Oct. 31, 1938.

Table 4—Estimated Cars in Use by Makes

(As of Oct. 31, 1938)

Make of Car	Number Surviving at End of Model Year
Auburn-Cord	76,019
Buick	1,172,240
Cadillac	95,998
Chevrolet	5,729,902
Chrysler-Maxwell	555,219
De Soto	302,639
Dodge	1,241,896
Durant	105,940
Ford	6,234,427
Franklin	24,865
Graham-Graham Paige	179,722
Hudson	249,359
Hupmobile	128,445
La Salle	109,052
Lincoln-Lincoln Zephyr	78,320
Nash-La Fayette	447,757
Oldsmobile	863,531
Packard	350,077
Pierce-Arrow	25,404
Plymouth	2,289,675
Pontiac-Oakland	1,139,466
Reo	57,494
Studebaker	512,777
Terraplane-Essex	620,952
Willys-Overland	507,785
Total These Makes	23,098,761
Miscellaneous	251,391
Total All Makes	23,350,152

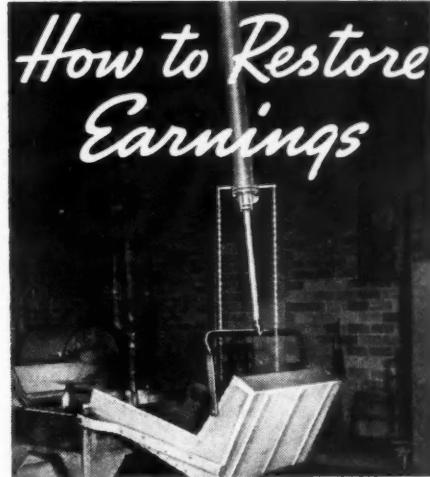
Here again it is of interest to check our computed registrations of cars by makes with the same official count as of July 1, 1938.

	Estimated Data	R. L. Polk Count	Percentage Difference
Buick	1,172,240	1,213,676	-3.4
Chevrolet	5,729,902	5,894,195	-2.6
Ford	6,234,427	6,568,436	-5.1
La Salle	109,052	105,330	+3.3
Plymouth	2,289,675	2,288,837	None

In a table on page 202, we present a picture of estimated cars in use as to make of car and year of manufacture. It is freely admitted that these data are subject to controversy, but at the same time we do maintain that

it is a fairly accurate picture of the situation at the end of the model year, at least accurate enough for any purpose to which it will be put.

On other pages in this issue will be found a count of total registrations of cars, trucks, and buses which for 1938 amounted to over 29,000,000 vehicles of which passenger cars constituted approximately 25,000,000 units. It is naturally somewhat confusing to mention an official count as of July 1, 1938, for passenger cars of 23,538,036 and then in



## With CURTIS AIR POWER HOISTS

Original cost, maintenance costs, depreciation are all lower with sturdy, simple Curtis Air Hoists than with other types of power hoists. And they provide smooth, dependable, accurate material handling which speeds up operations. All this adds up into profits.

Curtis Air Power Hoists show unusual stamina on the tough jobs. Ruggedly constructed with only one moving part, they operate for many years with a

minimum of attention. They are not subject to injury from overloads or bad atmospheric conditions.

Examine your plant for applications of Curtis Air Power Hoists—it's an important opportunity to add to profits by cutting lifting expense.

For suggestions and useful data on Air Power, send the coupon below for our booklet, "How Air is Being Used in Your Industry."

**CURTIS** COMPRESSORS • AIR & HYDRAULIC CYLINDERS  
AIR HOISTS • I-BEAM CRANES & TROLLEYS

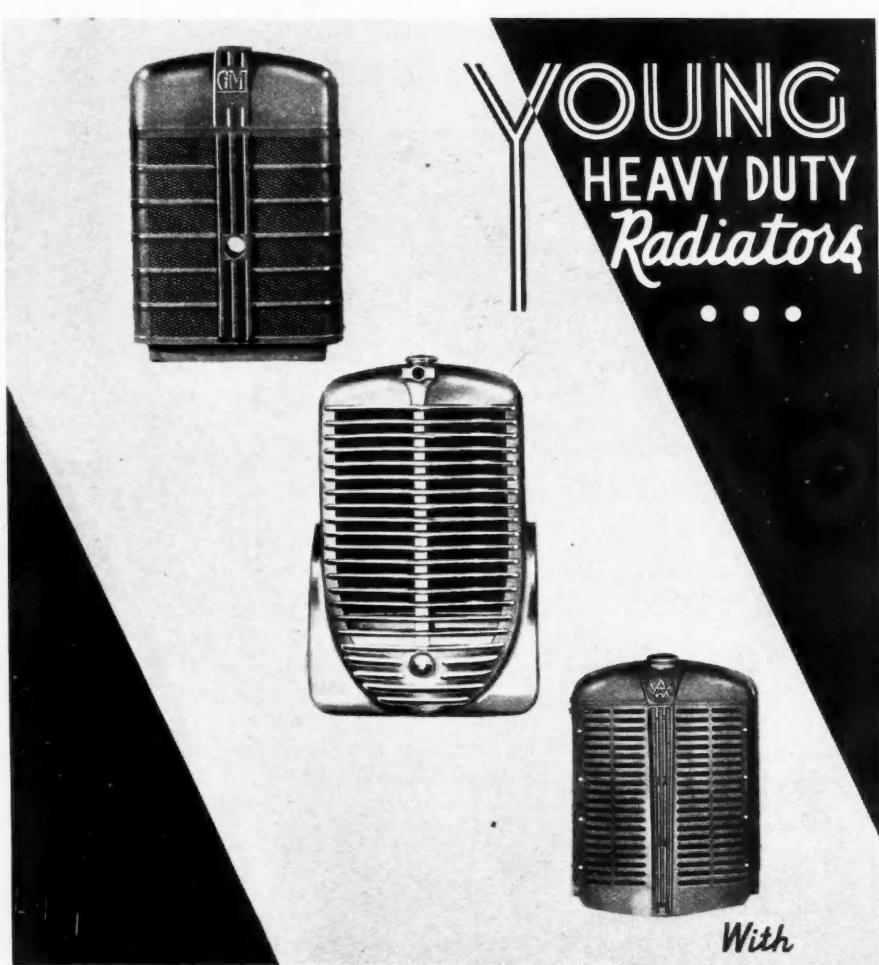
CURTIS PNEUMATIC MACHINERY COMPANY  
1917 Kienlen Avenue, St. Louis, Mo.  
Gentlemen: Please send me your booklet, "How Air is Being Used in Your Industry," and further information on Curtis Air Power Hoists.

Name \_\_\_\_\_ Street \_\_\_\_\_  
Firm \_\_\_\_\_ State \_\_\_\_\_  
City \_\_\_\_\_

another location a count of 25,000,000 cars. In the count of 25 million passenger cars there are innumerable duplications which it is impossible to delete. There are also other vehicles included with passenger cars which are not cars. For instance, California includes over 130,000 light commercial vehicles with passenger cars. Many other states follow the same procedure. Buses are included in the passenger car count in many states as are also hearses, funeral cars, etc. Numerous duplications are found in non-resident registrations and also in transfers. The

State of Massachusetts, for example, has 155,000 transfers, which fortunately we are able to delete from their total registrations. However, in many states these cannot be eliminated in those cases where they should be.

The count as of July 1, 1938, is an actual count of each registration card in the office of the motor vehicle commissioner. By this method practically all duplications or incorrect registrations are eliminated and we feel that the resulting count is a much more accurate picture of the true number of cars in use.



### For Cooling Diesel or Gasoline Engines

THE trend toward streamlining has entered the field of heavy duty industrial equipment. In addition to ruggedness and efficiency radiators for this equipment must have lines blending into a composite pleasing appearance. Young Engineers have been prominent in the development of many of these units and can also take care of your problem. Place your specifications before us.

Write for Descriptive Literature.

**YOUNG RADIATOR COMPANY**  
RACINE, WISCONSIN



### Process for Treating Aluminum Pistons

THE process of treating aluminum pistons, after anodizing, with Aquedag, a suspension of colloidal graphite in water, has been patented in England by Aluminum Colors, Inc. The machined pistons are first anodized by suspending them in an electrolyte containing 20 per cent sulfuric and 5 per cent oxalic acid. With the pistons acting as anode, current at 14 volts is sent through the bath for 30 minutes, at a current density of 13 amperes per sq. ft. Aquedag diluted with six times its volume of water is then applied to the anodized surfaces with a brush. After the coating has dried it is said to be hard to remove, and it evidently has good lubricating and anti-scoring properties.

### Endurance Limit Under Torsion of Shafts

ACCORDING to German investigations, the endurance limit under torsion of shafts with radial drill holes (oil holes) can be materially increased by cold-working the material around the outer end of the drill hole by means of a punch. Optimum results were obtained with a punch having the form of a square pyramid with well-rounded corners, the punch being introduced into the hole with two of its sides parallel with the axis of the shaft. Tests were made on shafts of 60 mm. (2-11/16-in.) diameter, and it was found that by cold working of the edge of the drill hole the endurance limits of shafts of two heat-treated steels could be increased by from 28 to 63 per cent.—ATZ, Dec. 25.

### SAE Cutting Fluid Committee Meets

A meeting of the Independent Research Committee on Cutting Fluids was held in Detroit recently. Arrangements were made to start a new research project which will classify machining operations and coordinate this with the machinability rating of commonly used ferrous and non-ferrous materials. It is expected that this classification will permit a better approach to the selection of cutting fluids for specific operating conditions.

The committee reports that its recent survey of cutting fluid recommendations for non-ferrous materials indicates that there is a dearth of publicity information on this subject. It is expected that the new project will provide specific recommendations for the machining of non-ferrous material.

"**S**tands considerable hot or cold working"

"**H**as a uniform normalized condition"

"**E**minitely superior to alloy castings or welded tubes"

"**L**engthens life of finished parts"

"**B**oth in production and performance, very successful"

"**Y**our tubing always meets our specifications"

*... reports from*  
*Auto parts makers about*  
**SHELBY SEAMLESS**  
**TUBING**

**N**OWHERE can you find better proof of SHELBY's quality than in the experiences of automotive parts makers who are now using it in their production. These men require tubing that is strong, easy to machine and fabricate, free from inclusions or hard spots, dimensionally accurate, and above all, thoroughly uniform from end to end.

SHELBY meets these requirements with consistent regularity. That's

why, every year, millions of feet of this top-quality tubing go into axles, housings, drag links, tie rods, steering columns, torque tubes, shock absorbers, and other vital parts.

When you need tubing, call the SHELBY Distributor. Because of the increasing demand for SHELBY, he is now carrying larger stocks than ever, ready to give you exactly the kind of service you need.

Write for complete information.

# NATIONAL TUBE COMPANY



Columbia Steel Company, San Francisco, Pacific Coast Distributors • United States Steel Products Company, New York, Export Distributors

# UNITED STATES STEEL

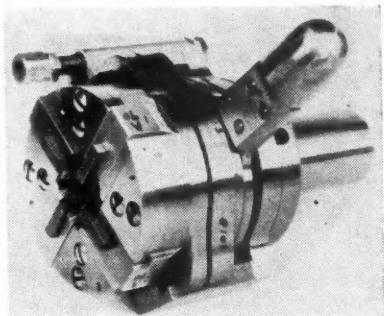
## Insert Chaser Die Head

*... New style for use on hand screw machines and turret lathes*

A new style of H & G insert chaser die head for use on hand screw machines and turret lathes has been developed by the Eastern Machine Screw Corp., New Haven, Conn. The head uses the same insert chasers as other styles and is made in what is known as 101, 102 and 103 sizes, the latter size having a range from  $\frac{1}{4}$ -in. up to  $1\frac{1}{4}$ -in. long threads and up to  $1\frac{1}{2}$ -in. di-

ameter in short threads. All three sizes of heads use the same chasers where the sizes are within their rated capacities.

The drive is by torque arms located a maximum distance from the center. The head may be tripped either by pull-off or by front end contact, the latter being especially desirable for close to shoulder threading or for cutting extremely short threads. Fine adjustment for length of thread is self-contained on the head itself. The shank of this head is detachable and can be furnished in any reasonable diameter. There is a clearance hole through the



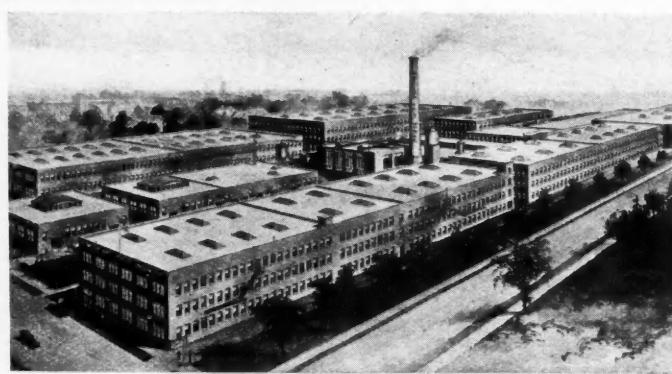
H & G insert chaser die head

shank making it possible to cut any length of thread in diameters up to the die head's normal capacity.

## Lighting Unit

*... For industrial operations which require accurate discriminations of color*

The Benjamin Electric Mfg. Co., Des Plaines, Ill., has brought out a new lighting unit for industrial operations which require accurate discrimination of color for matching, grading, and sorting. Known as the "Daylight" fluorescent lamp diffuser, the unit provides a minimum of 100 footcandles of daylight quality light of 6500 deg. Kelvin color temperature rating which can be uniformly distributed over an area 3 ft. by 4 ft. when a 36-in. lamp is suspended 30 to 36 in. above the surface; a proportionally lower intensity over a relatively smaller area is provided by an 18-in. lamp. Among many applications, the unit is recommended for color inspection in dipping,



## Western Felt Serves the Automotive Industry in Many Ways

WHETHER your business requires felt products made and cut to standard or special specifications, Western Felt Works is equipped to give you prompt service. In its large and modern plant, it has complete manufacturing and cutting facilities, as well as Research and Experimental Laboratories.

Floor Board Anti-squeak Strips

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Packing — Gaskets

Sheet Felt for Polishing and Rubbing

Gaskofelt Gaskets — Jute Felt Insulation — Resistofelt

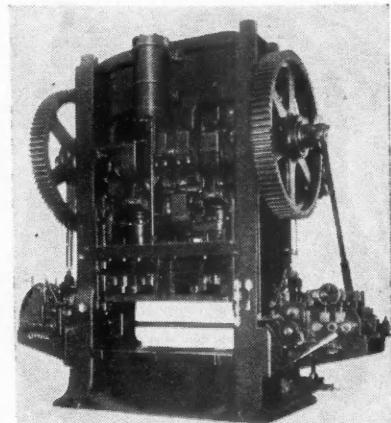
Furnished in Rolls or Cut to Size

Estimates and recommendations gladly furnished

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4035-4117 Ogden Avenue

Branch Offices in All  
Principal Cities  
Established 1899

Largest Independent  
Manufacturers and  
Cutters of Wool, Hair  
and Jute Felt



Difficulties encountered by one large automobile manufacturer in handling wide sheet stock have been overcome by the installation of six roll feed units built by the F. J. Littell Machine Co., Chicago. The roll feeds have a capacity for stock  $5/32$  in. thick by 24 in. wide and are mounted on 900-ton straight-sided presses, as illustrated above. The speed of these presses is 15 cycles per minute with a 28-in. length of feed. Feed rolls measure 8.6 in. in diameter by 26 in. in width.

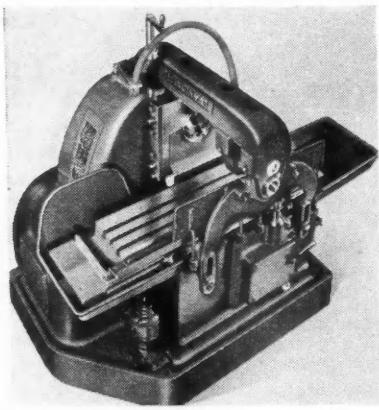
spraying, rubbing and finishing operations in paint shops of automobile plants; also for inspection for color and quality of plastic materials.

### Milling Machines

*... Of fixed bed type with table travel of 18 in. or 24 in.*

The new No. 2-18 and No. 2-24 plain automatic milling machines announced recently by The Cincinnati Milling Machine Co., Cincinnati, Ohio, are of the fixed bed type and available with a table travel of 18 in. or 24 in. The new machines are particularly adaptable for the manufacture of medium size automotive and aircraft parts.

The machines feature 20 spindle speeds, ranging from 30 to 1200 r.p.m., and 16 feeds from 1 in. to 40 in. per minute. To further adapt the ma-



Cincinnati Milling Machine

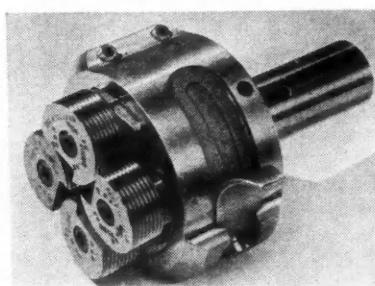
chines to high production milling, an automatic spindle stop; a hydraulic backlash eliminator; dog-controlled, automatic working cycles for the table with intermittent feed are provided.

### Die Head

*... With adjustable compensating float which "cushions" chasers on to work*

The National Acme Co., Cleveland, Die Division, has a newly designed die head for Brown & Sharpe automatics. This head is built in sizes  $\frac{1}{4}$  in.,  $\frac{3}{8}$  in., and  $\frac{9}{16}$  in. capacities and uses the standard or special ground thread circular type of chasers.

Among the new features of head construction is an adjustable compensating float which "cushions" the chasers on to the work, preventing torn or distorted threads at high spindle speeds. Two methods of closing the die are provided: either held closed under tension while the turret indexes; or closed in the last position just prior to threading by a simple stop arranged to arrest the forward travel of the die slide. Selection of the closing method may be made to accommodate the number of other tools used and to insure positive performance under fast indexing of the machine turret.



National Acme die head

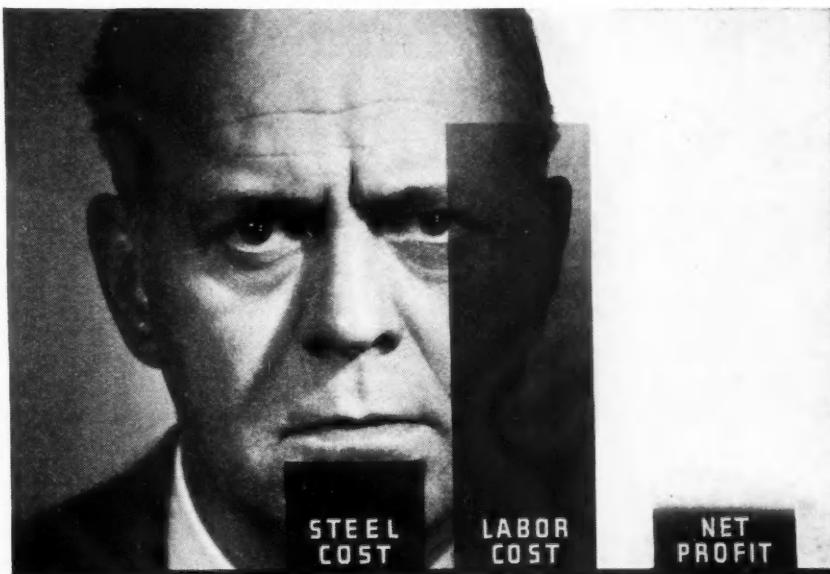
Quick adjustment to diametric cutting size is by means of only two screws

which move all the circular chasers (with holding blocks intact) uniformly and at the same time.

Circular chasers mounted on blocks are removed for resharpening by loosening one screw, and by the use of a sizing micrometer fixture. When returned to the head the cutting size is not changed, therefore no adjustment is necessary after grinding. The circular chasers provide for 270 deg. of grind on circumference.

Chasers can be changed to hollow milling and forming tools simply by substitution of cutters and holding blocks.

(Next page, please)



## Consider Labor Costs When Buying Steel

On most jobs, shop labor costs are the biggest single factor—and they depend to a large degree on the steel used. If bars are too hard for bending or forming—or have hard spots to break or dull tools—if some shapes are not straight—or if in the case of alloy steel the required properties are not developed by the first heat treatment—then up go costs, down go profits.

Purchasing steel that is uniform and has the properties most desirable for your particular use often pays big dividends in the form of decreased shop costs. You do not have to pay any more for this kind of steel—so why not get it?

For several years Ryerson has been building up stocks of these better, more uniform steels. Careful selection, checking, testing, and inspecting assure the uniform high quality necessary for Ryerson Certification. Try Ryerson Certified Steels on your hardest job—and check the labor costs. Many have told us that it pays.

JOSEPH T. RYERSON & SON, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

**RYERSON**  
*Certified*  
**STEELS**



## Optical Inspection

*... Comparator and measuring machine has a 30-in. diameter screen*

The Jones & Lamson Machine Co., Springfield, Vt., has announced a new model of its comparator and measuring machine, which has a 30 in. diameter screen. Typical parts for which the machine is suited are, large form tools, cutters, hobs, taps and gages, as well as products. The following lenses can be furnished:

20X lens which will project a 1½ in. area object.

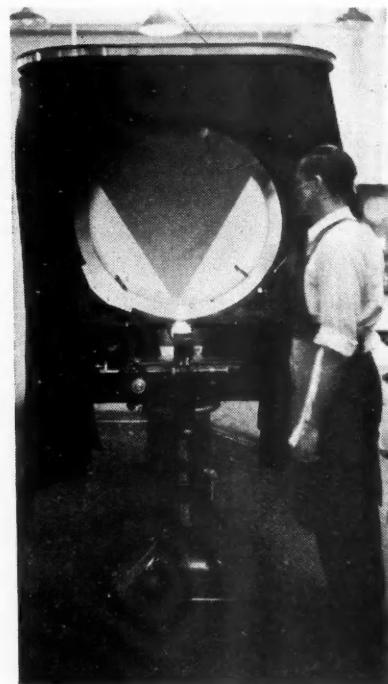
30X lens which will project a 1 in. area object.

50X lens which will project a 0.6 in. area object.

100X lens which will project a 0.3 in. area object.

The periphery of the 35 in. diameter ring, which supports the screen, is graduated to one-half degrees, reading with the vernier to one minute of arc. This machine will accommodate objects 8 in. in diameter by 21 in. long and has provisions for measuring 4 in. on the coordinates.

The machine is furnished with any one of three types of table; plain table without lateral adjustment, table with

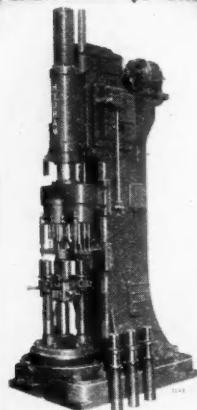
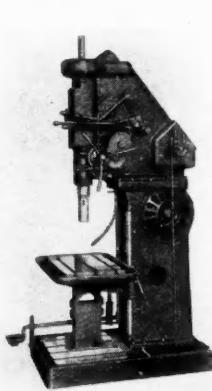


Jones & Lamson comparator and measuring machine

4 in. lateral travel, and table with 8 in. lateral travel. The table may be swiveled to position the helix of hobs and taps normal to the axis of the lens system.

Lead measurements on the tables with lateral travel may be accomplished by the use of the micrometer attached to the table, by spacing blocks or end measuring bars.

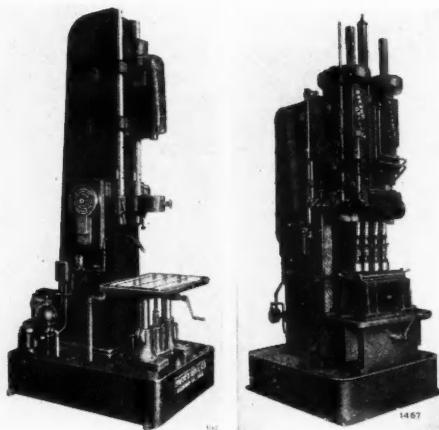
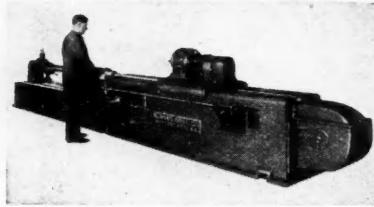
## DRILLERS - - - HONERS To Increase Production and Profits



As long-established manufacturers of Self-Oiling, All-Gear Drilling Machines and Hydraulic Honing Machines, we can provide standard or special equipment for a wide variety of drilling, boring, reaming, tapping and similar operations; and any honing whatever. Descriptions, specifications, and prices of our standard machines will be sent promptly on request. Write for catalog E. The cooperation of our engineering department is available without charge for developing new applications of our products.

**Drilling** — Above at left is shown a typical Self-Oiling, All-Gear Drilling Machine with quick-change speeds and feeds. A wide variety of sizes and types, some with pick-off gears, are available. Hydram Drilling Machines are big and powerful, have automatic operating cycle including stepless hydraulic feed directly over center of cutting tools. Shown above at right is a Hydram with special multiple-spindle head and rotating fixture. High Production Units in practically unlimited variety, number of spindles and applications incorporating Self-Oiling, All-Gear Drilling Machines and Hydrams are designed to meet special requirements.

**Honing** — Self-Oiling Hydraulic Honing Machines are accurate, fast, economical, have exclusive advantages. Illustrated directly at right is our new No. 194 single-spindle Honing Machine. Some smaller, and many larger sizes available. At far right is shown a Multiple-Spindle Honer. These also are built in various types. For honing work too long to handle vertically, Horizontal Honers are available in a number of sizes, one of which is shown below. Write today for complete Honer information.



**BARNES DRILL CO.** 817-847 CHESTNUT STREET  
ROCKFORD, ILLINOIS, U. S. A.



Grob electric butt welder

1/16 in. width up to 1/2 in. width.

The saw blade clamps are of an entirely new design to permit positive and accurate line-up of the saw blade, and full electrical contact. The saw guides are adjusted so the teeth of the saw blades are outside of the clamp, only the flat part of the blade is in the clamp. The clamps are provided with an eccentric connected with a small lever, and the clamps automatically adjust themselves to various thicknesses of the saw blades. Saw blades are firmly held during the welding and annealing operation.

After the saw blade has been welded and annealed, it is removed from the clamps ready for grinding. The grinder quickly removes the welding flash. The grinder is a built-in unit with a high grade ball bearing motor with grinding wheel guarded. A Bakelite wheel is used, as other wheels will not endure the high speed of the motor.

The overall dimensions are 12 in. high, 8 in. wide and 8 1/4 in. deep. Shipping weight per unit is 58 lb.

#### Hoist

... *Lightweight wire rope electric unit added to Wright Mfg. line*

The Speedway, a lightweight low-cost wire rope electric hoist, has been added to the present line of this equipment made by the Wright Mfg. division of the American Chain & Cable Co., Inc., York, Pa.

Hoisting capacities range from 250 lb. to 750 lb. and hoisting speeds 15 ft. to 45 ft. per min. The construction includes fully enclosed ball bearing motor, anti-friction bearings, cut alloy steel spur gears, multiple disc solenoid brake, push button control, and pre-formed hoisting cable.

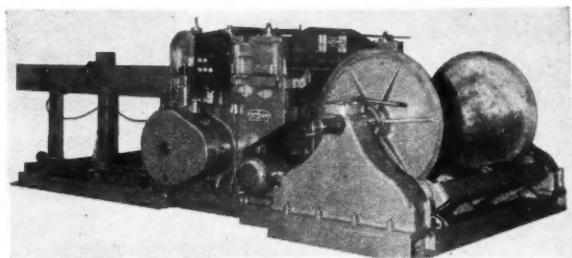
#### Cut-to-Length Shear

... *Capacity to handle from 24-in. to 78-in. wide stock*

Illustration herewith is a Cleveland automatic cut-to-length shear arranged with uncoiler, five roll leveler and feed rolls. The shear, which has capacity to handle from 24 in. to 78 in. wide stock, is equipped with a discharge table located back of the shear, which holds the sheet in position until the cut is made at which time the discharge is automatically tripped and the sheet drops into a buggy which is placed in the stacker. The shear is the down cut type, the eccentric shaft by which the shear is operated being located below the bed and so designed that the connections pull down on the slide. The shear is arranged for a speed of 60 strokes per minute while the feed is arranged for a speed of 200 ft. per minute. The number of cuts which can be made per minute is, of course, determined by the length of the feed.

The stacker unit, or run-out table, is adjustable to accommodate sheets

Cleveland cut-to-length shear



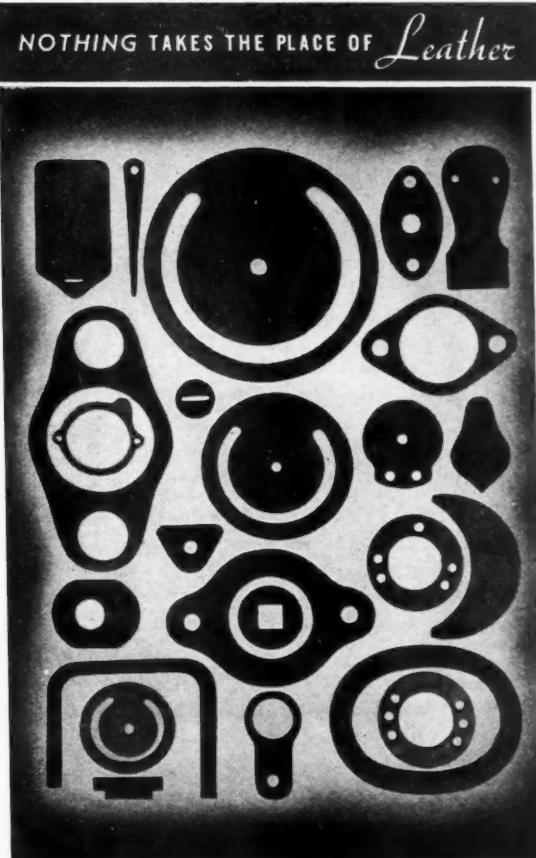
24 in. to 78 in. in width and is arranged for a feed of 6 in. minimum to 120 in. maximum, although the length of feed can be increased by extending the stacker guides on which the timer is mounted. The heavy duty uncoiler is

of the cradle type and so designed that as the coil decreases in size, all rollers continue to bear on the outside of the coil, the rollers being covered to prevent marring the material.

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## Hydraulic Packings and MECHANICAL LEATHERS



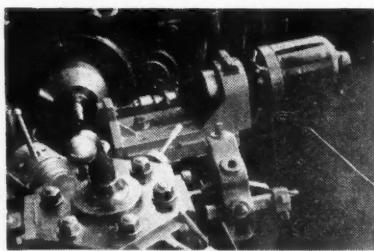
**Send Us Specifications or Samples for Prices!**

**EXCELSIOR LEATHER WASHER MFG. CO.**  
ROCKFORD, ILLINOIS

## Drilling Unit

*... Adapted to use on screw machines and turret lathes*

The Hole Engineering Service, Detroit, is manufacturing a compact, self-contained unit adapted to use on screw machines and turret lathes for drilling cotterpin or cross holes in studs and similar work. It incorporates a Govro-Nelson automatic drilling unit, which employs the principle of centrifugal force for feed pressure. The unit is mounted in a special bracket, which includes a bushing support in combination with a V-block stop.



Hole drilling unit

With this device, the cross holes are drilled in the studs before they are threaded, thus eliminating burrs and a burring operation on both the hole and

the thread. With suitable riser block the assembly can be mounted on the screw machine cross slide in line with the machine spindle, so that the V-block bushing support may be brought in contact with the work after the machine spindle is stopped. When the operator presses a push button switch, the unit feeds the drill through the work and automatically returns it to the starting position.

## Blower Wheels

*... Double inlet type made without rivets from pressed steel.*

Designed for warm air furnace blowers and similar applications, a new line of double inlet blower wheels made without rivets from pressed steel has been announced by the Torrington Mfg. Co., Torrington, Conn. The "Airotor" line of blower wheels is available in 12-in. and 16-in. diameter sizes. A third size, 20-in. diameter will soon be added.

## NOTHING TO THROW AWAY

**But the  
Used  
Filtering  
Material**

★ ★ ★ ★

**Container  
Is Not  
Discarded**



### REDUCE YOUR COSTS — AND KEEP YOUR OIL CLEAN LONGER

With the *MICHIANA* re-packable filtering element—there is no need for complete replacement—you can save this expense—because only the dirty filtering material is discarded.

#### NOW ADAPTED TO OTHER MAKES OF REPLACEABLE ELEMENT FILTERS

In answer to requests of bus, truck and fleet owners, *MICHIANA* has now made its Re-Packable Element adaptable to filters of other makes—giving them the low cost repacking feature heretofore available only with *MICHIANA* Filters.

*Ask for descriptive literature*

**MICHIANA PRODUCTS CORPORATION,**

**Michigan City, Indiana**

**MICHIANA**  
*Duo-Flo*  
**DEPTH TYPE FILTERS**

*Ask for Booklet  
337-A*



February 25, 1939

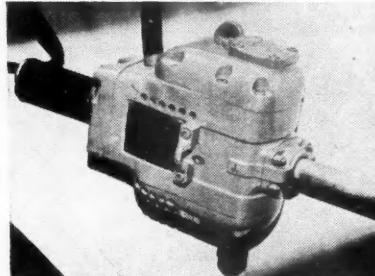
*When writing to advertisers please mention Automotive Industries*

*Automotive Industries*

## Nut Runner

*... Hicycle tool styled by Designers for Industry, Inc.*

A hicycle nut runner styled by Lawrence Blazey of Designers for Industry, Inc., Cleveland, for the Chicago Pneumatic Tool Co., is made of cast



Hicycle nut runner

aluminum and incorporates steel inserts for bearing faces of moving parts.

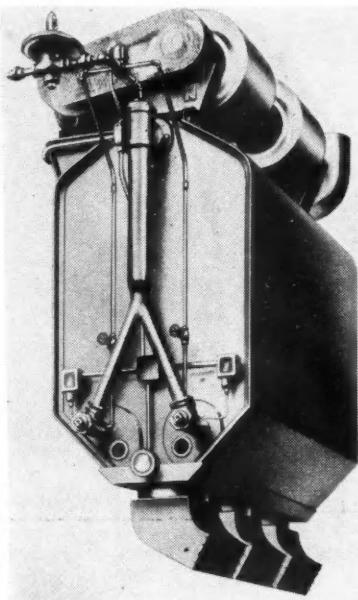
Features lie in the design of the chuck end for clearance in tight corners, designing the handle bracket in malleable iron for attachment to the casing, and tying the component parts of the tool together by means of the recessed panel running around the casing.

## Industrial Heater

*... Dravo introduces suspended type gas-fired unit*

Dravo Corp., Pittsburgh, Pa., has introduced a new high capacity suspended type unit heater designed for use in large industrial buildings where high velocity heated air is desired to heat rooms of large floor area and high ceilings.

Identified by the name LEE sus-



Dravo industrial heater

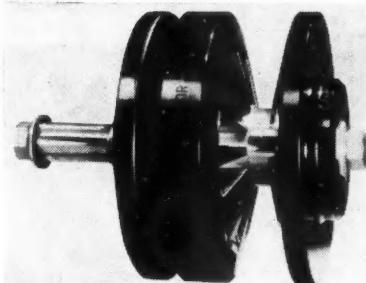
pended type unit heater, this gas-fired unit will operate on natural gas, manufactured gas, or coke oven gas. It is 3 ft. wide, 5 ft. long and 7 ft. high, weighs 3000 lb. and is of welded steel construction throughout. It has an output capacity of 500,000 b.t.u. per hr. The air discharge is 5500 c.f.m. with an average temperature rise of 110 deg. Fahr. and correspondingly high outlet temperatures. Air velocity at heater outlets is 2000 f.p.m. Two blower type fans are used to spread the air.

### Variable Speed Pulleys

... *Made of solid high impact strength Bakelite*

Continental Machine Specialties of Minneapolis, has improved its "Speedmaster" variable speed pulleys. These pulleys are moulded of solid high impact strength Bakelite, accurately trued and balanced before final assembly. An improved pressure lubricated bronze sleeve allows the splined center sheave member to operate freely, regardless of load or speed.

The new construction is available in two sizes, a 3½ in. diameter size for drives up to ½ hp. capacity and a 6½ in. diameter size for drives up to 3 hp. capacity. The pulley is said to be very flexible in its adaptability to both



Continental "Speedmaster" pulley

"straight line" and "angular" drives.

Advantages claimed by the manufacturer for the improved Speedmaster are: a six-to-one up to a forty-to-one ratio of infinitely variable speed, the use of standard "V" belts, and long belt and pulley life because of the moulded plastic work faces.

### Punch Press

... *Production increased by slowing down speed of machine*

It sounds paradoxical that the number of blanks produced from a power

driven punch press could be increased by *slowing down* the rate of speed at which the press was operated. Yet, such an increase in production has been accomplished—and by this means—at The Reliance Electric & Engineering Co.'s Cleveland plant.

As originally installed, an 1800 r.p.m. ac induction motor had been belted to the flywheel of the punch press. This, in turn, was caught by a clutch having a maximum catching time of ½ revolution of the flywheel. Since the operator punched as many as 5 to 6 blanks from one strip of material he lost considerable time waiting for the flywheel to

(Next page, please)

A RECENT INDEPENDENT SURVEY ASKED:  
"Based on your own experience in cutting oils, which companies would you recommend?"



Houghton, 2 to 1  
OVER THE SECOND CHOICE

### CUT-MAX

An all-inclusive series of straight cutting oils and bases, embodying the latest developments in sulphurized and E. P. treated products for every cutting need.

CUT-MAX Base No. 7, containing an 18% minimum of superactive sulphur—combined in a colloidal state—is absolutely unequalled in refrigerating and cutting efficiency. We will prove this in your plant.

Further, Houghton was given three times as many "firsts" as any other supplier of cutting coolants. Quality, reliability, product performance over fifty years, have built this leadership.

Today Houghton still leads because of the proven ability of its cutting oils to provide finer finish, higher surface speed and longer tool life. Write for illustrated leaflets describing CUT-MAX Straight Oils and Bases, and the "60" Series of Soluble Cutting Oils.

E. F. HOUGHTON & CO.  
240 W. SOMERSET STREET  
Chicago - PHILADELPHIA - Detroit

THE HOUGHTON LINE  
OF STRAIGHT AND SOLUBLE CUTTING OILS

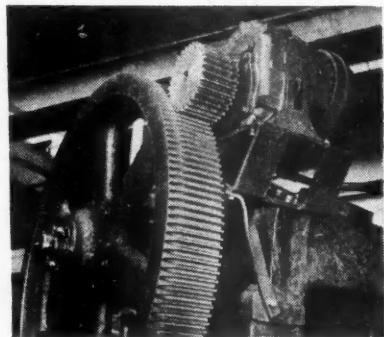
catch after he had pressed the foot pedal to engage the clutch. On the other hand, the flywheel speed was too great to allow him to blank all the pieces from each strip at one pressing of the foot pedal.

The circumstances were such, therefore, as to suggest experimenting with a reduction of flywheel speed sufficient to allow the operator to complete the 5 or 6 punchings without interrupting the operation of the press.

Because the press was over-powered for the work, reducing the power capacity of the flywheel by slowing it down was of no consequence. The driving pulley of the existing belt drive

was already small and could not very well be made smaller. A lower speed motor was also out of the question because of space limitations. Consequently, the necessary reduction in flywheel speed was accomplished by cutting teeth into the flywheel face and applying power directly to the flywheel through a micarta pinion of a  $5\frac{1}{2}$  to 1 reduction gear motor driven by the 1800 rpm induction motor.

This arrangement reduced the flywheel speed to the point where the operator could easily blank 5 or 6 pieces at one pressing of the foot pedal. In addition, the direct-gearred drive had the further advantage that, unlike the



Micarta pinion and flywheel on machine in Reliance plant

belt drive which it replaced, no slipping could occur between the motor and flywheel when starting.

The drive is quick and functions smoothly. Likewise, by reducing the number of times the clutch is operated, much clutch wear has been eliminated and at the same time the job made less tiring for the operator.

**"We Want the  
HANCOCK  
Rotary DOOR LATCH  
... tell us how  
to get it"**

**People Go For The Cars  
with this  
SAFETY AND CONVENIENCE  
FEATURE**

You should see the mounting stack of letters from people—everywhere—asking how they can obtain this safer, more convenient door latch. It is evident that motorists don't like the hard-to-close door—that they do want the Hancock easy-to-close rotary latch.

**HANCOCK**  
Safety DOOR LATCH  
HANCOCK MFG. CO. — JACKSON, MICH.

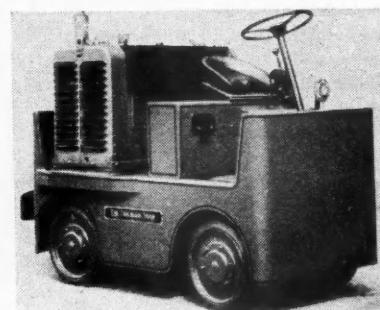
**Non-Slam Latch that Rolls Itself Shut**

### Electric Tractor

... Four-wheel drive, four-wheel steer type designed by Mercury Mfg. Co.

A new heavy duty electric tractor of the four wheel drive, four wheel steer type has been designed by the Mercury Mfg. Co., Chicago. It develops 3500 lb. draw bar pull and has a light running speed of seven m.p.h. The design incorporates two heavy duty double reduction spiral bevel and spur geared drive axle assemblies with full floating axle shafts and tapered roller bearing mounted wheels. Wheels are fitted with 20 by 6-in. solid rubber tires and each drive is powered with a series wound vehicle type motor.

The tractor brake system is of the four wheel equalized type. External contacting shoes operate on drums



Mercury heavy-duty electric industrial tractor

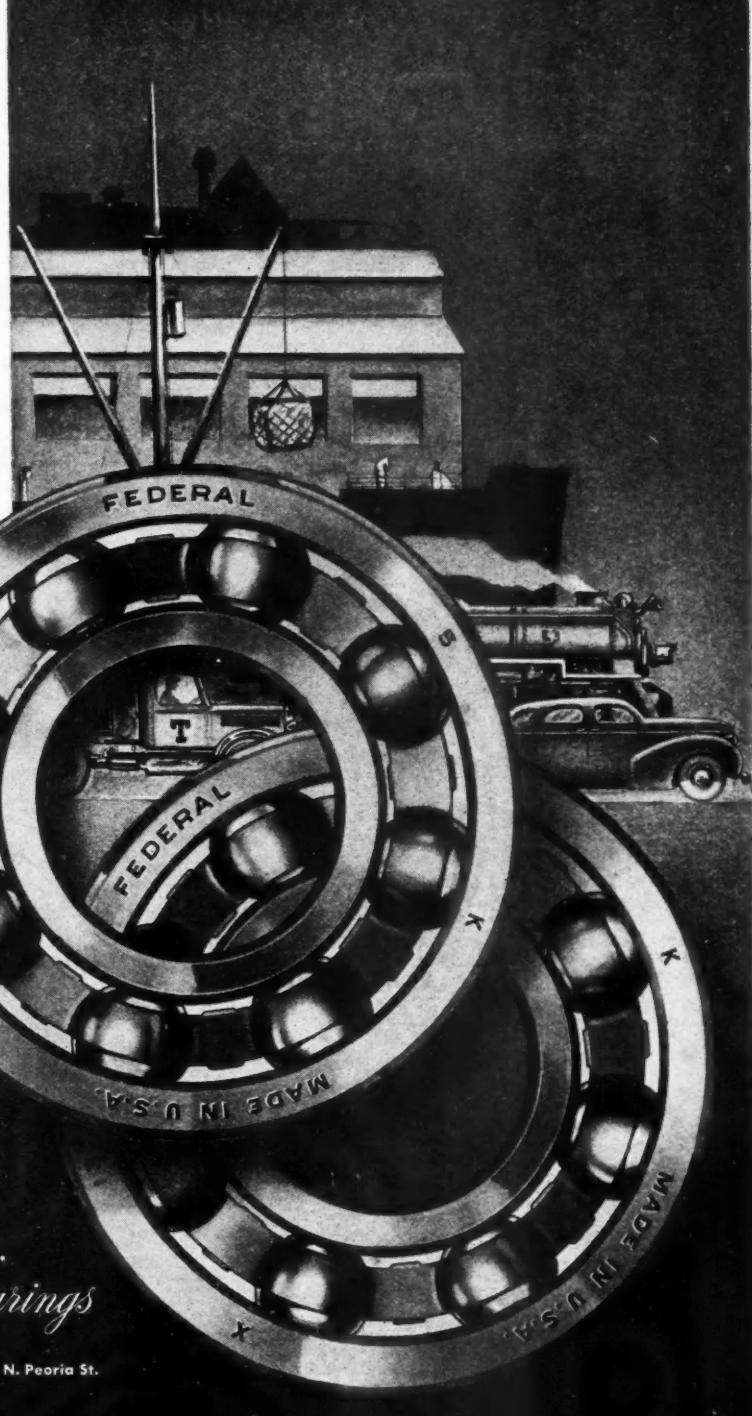
mounted on intermediate gear shaft extensions on each drive axle.

The travel controller governing both motors is of the Mercury mechanical contractor type providing three speeds forward and reverse. Steering is of the four wheel type and a large diameter hand wheel controls all four wheels through a Ross cam and lever unit.

(Turn to page 286, please)

# FEDERAL

FEDERAL BALL BEARINGS have long enjoyed a reputation for efficient performance. They are used in various industries, products and machines. High-grade steels, carefully heat-treated assure strength and stamina so essential to uninterrupted service. Made by experts in a large, modern plant where quality is considered the most important factor in the manufacture of ball bearings.



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# BEARINGS

Automotive Industries

When writing to advertisers please mention Automotive Industries

February 25, 1939

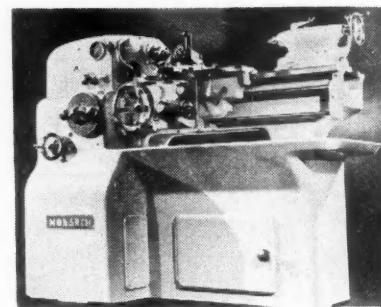
## Streamlined Lathe

*... Monarch introduces new 10 in. by 20 in. machine*

The Monarch Machine Tool Co., of Sidney, Ohio, has introduced a new 10 in. by 20 in. sensitive precision lathe.

This Monarch development is said to have many outstanding advantages. Among them are—almost unlimited range of gearless, stepless spindle speeds—forward and reverse; wide range of threads and feeds, through enclosed quick-change gear box, which is operated by one hand; carriage held in secure alignment to the non-wearing

and ground bed ways, by five self aligning ball bearings, which are mounted on eccentric studs; anti-friction bearings used throughout; practically automatic lubrication; three-point bearing on the floor, insuring accurate alignment; entire threading gear train, electric furnace hardened, gears with tooth contours ground, gear box operating in oil bath; neat, pleasing modernistic and practical design with a definite place for everything, and no extra levers or gadgets that might look as though they were added as "after thoughts"; chromium plated handles and hand wheels; Endless belt automatically used for all feeds from



Monarch precision lathe

spindle to gear box, reserving and preserving the accurate gear train solely for thread chasing; quick lever-clamping tool post.

## Aluminum Ladder

*... Weighs only 43 lb.; supports load of 1000 lb.*

The Aluminum Ladder Co., Tarentum, Pa., recently developed a new warehouse, platform-type ladder which may be used to speed up handling and storage of products on shelves and bins. Casters on back legs make it easy to move from place to place.

This new ladder, designated as solid-type No. 206 is made of 51 S. T. Alcoa aluminum, having a tensile strength of 48,000 lb. per sq. in. It only weighs 43 lb., yet it will easily support a load of 1000 lb. The bottom of the ladder measures 28 in. by 22 in. and the platform, 22 in. by 22 in. The platform is 66 in. from the floor.

## Drilling "Smoke" Holes

*... Bradford machine finishes 600 pistons per hour.*

The Bradford Machine Tool Co., Cincinnati, Ohio, recently developed a machine for the drilling of closely spaced small holes such as the "smoke" holes in automotive pistons. The pistons being drilled by the machine illustrated herewith have 18 holes so spaced that it is impossible to drill them all simultaneously, therefore the machine is devised to drill 9 holes, automatically index the piston 180 deg. and then drill the remaining 9 holes.

Spindle speeds are 5100 r.p.m., and indexing time for the 180 deg. index



Molded parts from Bay Manufacturing Company

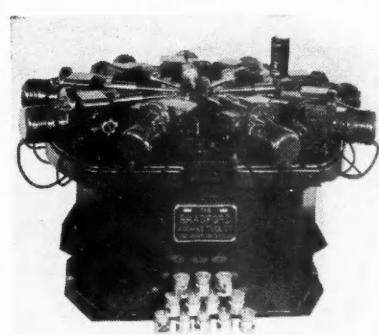
IT'S PRETTY HARD to get all steamed up over a little thing like an automobile horn button. But you'll have to admit that the Durez buttons shown above are just about the smartest looking jobs that ever graced the top of a steering column!

You'll find them this year on many leading makes of cars—harmonizing happily with color schemes, giving new safety and convenience, resisting all wear and tear. And with them you'll find control knobs, interior trim, even instrument panels—all made of this modern plastic.

Because Durez is adaptable to any design—because Durez parts can be formed and finished in one operation—leading car manufacturers have standardized on this material for many molded parts. If you would like to know more about Durez, write General Plastics, Inc., 92 Walck Road, North Tonawanda, N. Y.

General Plastics'

**DUREZ** Choice of the Automotive Industry



Bradford machine for drilling "smoke" holes in automotive pistons

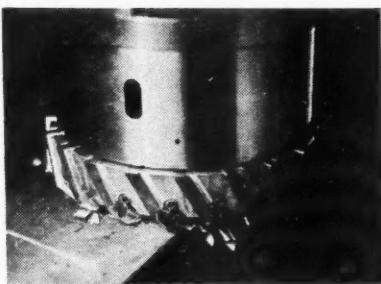
is less than  $\frac{1}{2}$  sec. The machine finishes 600 pistons per hour which is equivalent to 10,800 drilled holes. This high speed of operation and synchronization required the timing of some of the synchronizing cycles to within one tenth second.

## Face Mill

### *... Problem of chip removal handled in new way*

The Ingersoll Milling Machine Co. in its new "Shear Clear" face mill has attacked the problem of chip removal in face mills in a new way. The cutting edges have been set at cutting angles so that the chip moves outwardly—away from the surface cut. This is said to eliminate any packing of chips in the face of the cutter. The finished surface is not scored by chips dragging along it.

To accomplish this cutting blades are set at negative rake and steep positive shear angles. The corner of the cutting angles is further broadly chamfered off to direct the chips outwardly. The combination of the angles and chamfer is varied to suit the work. The



Cutter on Ingersoll face mill

whole makes a very free cutting tool and in some cases a considerable increase in life between grinds has been effected. The use of the chamfer precludes the cutters from being used into sharp corners.

## Collet Chuck

### *... Pads may be removed and new set installed in 2 minutes.*

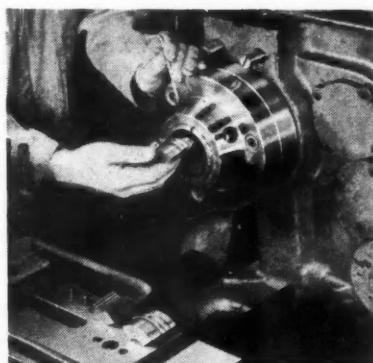
The Gisholt Machine Co. has announced new collet chucks of improved design for Nos. 3, 4 and 5 ram type universal turret lathes and 1L, 2L and 3L high production turret lathes. The chucks have capacities up to  $2\frac{1}{2}$  in. diameter for the ram type machines and up to  $4\frac{1}{2}$  in. diameter on the high production machines.

Removing pads from the new Gisholt collet chucks is said to take less than one-third the time formerly required and much less effort. It is only necessary to slip off the light aluminum chuck guard, after loosening a thumb screw, and take out the Allen cap screws that hold the pads in place.

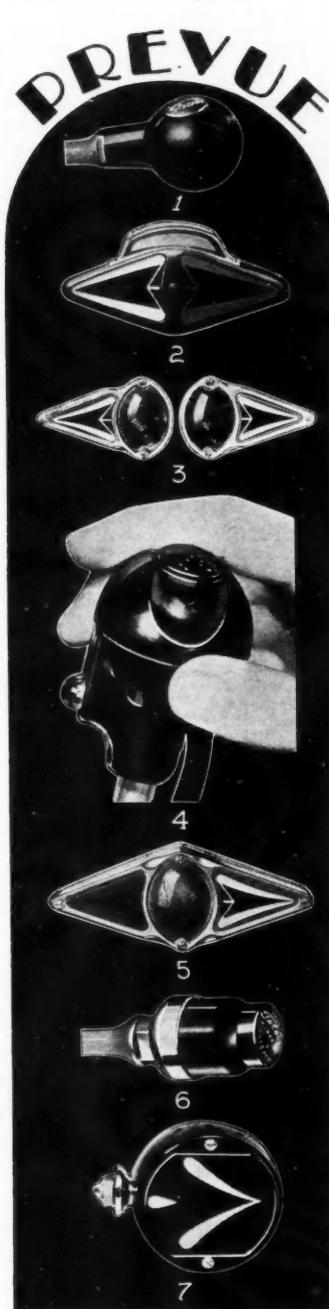
The new Gisholt collet chuck is of the push-out type. It has a four-jaw master collet provided with four accurately ground collet pads which

holds the bar material very accurately on center. The hardened steel collet hood is bolted and keyed directly to the American Standard A1 spindle nose. The master collet is keyed to the collet hood. Holes through the collet hood permit the removal of pad screws and the changing of collet pads without removing the collet hood from the spindle.

The collet pads are located in an accurately ground groove and held by Allen screws. Ground collet pads are furnished to fit any size or shape of bar stock such as round, square or hexagon. All collet pads are ground on the outside and round pads are ground on the inside after hardening.



Gisholt collet chuck



Teleoptic switches, signals, and signal equipment are protected by more than 30 patents and other patents pending. Numbers of these patents gladly given on request.

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TURN SIGNAL EQUIPMENT  
by  
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PIONEER MANUFACTURER OF  
DIRECTIONAL SIGNALS

For passenger cars and trucks of tomorrow—as well as today—Teleoptic Signal equipment leads in design for safety and appearance; ease of installation; simplicity of operation; and high quality of workmanship and materials.

Laws requiring directional signals on passenger cars are now being considered; combined with public demand for additional safety, this makes Teleoptic one of the "must" items for your consideration.

Illustrated are a few of Teleoptic's latest models and other models available as standard equipment. They are:

1. HANDI-TURN switch for mounting in place of regular knob on latest model remote control shift levers; adjustable to suit individual driver's convenience. (A1004)
2. LITE-MASTER, a beautiful combination turn signal and license plate light; fits tightly against body of car and blends into lines. Visible 125 feet day and night.
3. TWINS, a set of matched turn signals combined with stop, tail and license light, that will enhance the beauty of any car. Visible 125 feet day and night.
4. FINGER-FLIP switch for conventional gear-shift levers; replaces regular knob; includes pilot light. May be mounted on steering column. (A63)
5. DELUXE combination stop, tail, and turn signal light; includes license plate light; ideal for small trucks and passenger cars. Visible 125 feet day and night. (A20)
6. HANDI-TURN switch for mounting on remote control shift levers. (A1000)
7. COE 180 turn signal for front of car or truck. Mounts on hood of automobiles; is especially suitable for cab-over-engine trucks. Visible front, rear, and side, 125 feet day and night.

Not illustrated, but available for standard equipment, are semi-automatic, automatic, and switches that replace the horn button. We will gladly cooperate with you in solving your signal problems. Include Teleoptic equipment in your specifications. Write or wire for details.

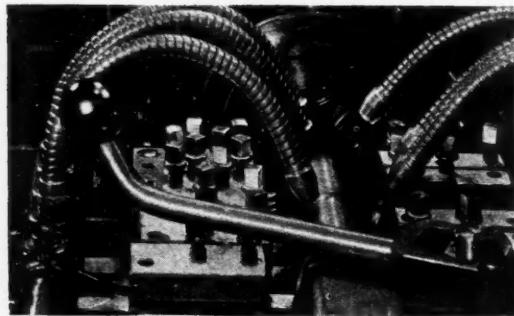
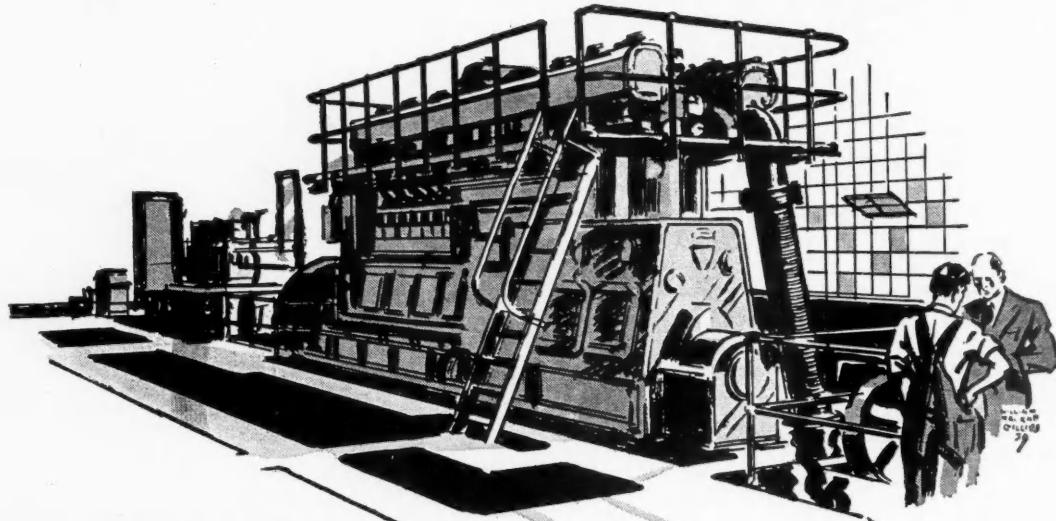
## THE TELEOPTIC CO.

Racine,  
Wisconsin

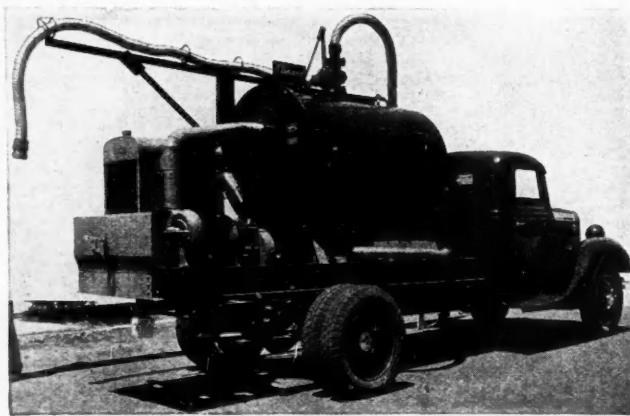
25 Years  
Experi-  
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Coolant feeds on this machine tool are neat, easily adjustable and stay exactly where they are directed. Flexible METAL construction withstands wear, assures constant, free flow without danger of contamination.



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